Noel and Patricia Holmgren

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NORTH AMERICAN FLORA

SAXIFRAGACEAE, HYDRANGEACEAE

JOHN KUNKEL SMALL, PER AXEL RYDBERG

CUNONIACEAE, ITEACEAE, HAMAMELIDACEAE

NATHANIEL LORD BRITTON

PTEROSTEMONACEAE

JOHN KUNKEL SMALL

ALTINGIACEAE

PERCY WILSON

PHYLLONOMACEAE

HENRY HURD RUSBY

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North American Flora was planned "to present in one work descriptions of all plants growing, independent of cultivation, in North America, here taken to include Greenland, Central America, the Republic of Panama, and the West Indies, except Trinidad, Tobago, and Curacao and other islands off the north coast of Venezuela. . . ."

The families of plants were distributed over 24 planned volumes, of which several were started in 1905 and succeeding years. Parts appeared at irregular intervals, written by various specialists. Because of the vast range to be covered (parts of which are even yet imperfectly known to botanists) it proved impossible to complete most volumes. In 1954 the original plan was abandoned and a second series was begun, to consist of parts treating plant groups in North America in no prescribed sequence.

Family 5. **SAXIFRAGACEAE**

By John Kunkel Small and Per Axel Rydberg

Annual or perennial, caulescent or acaulescent herbs. Leaves alternate or sometimes opposite, commonly all basal, rarely stipulate; blades simple and entire, toothed, lobed or divided, or compound and with toothed or lobed leaflets (*Astilbe*), the teeth often pore-bearing. Flowers perfect or polygamo-dioecious (*Astilbe*), borne in simple or compound open or congested cymes or racemes, usually terminating the main stem, or lateral branches which arise from the axils of the leaves near the apex of the rootstock. Hypanthium usually well-developed, flat, turbinate, campanulate or cylindric, more or less adnate to the base of the gynoecium. Calyx of 5, or rarely 4 or more sepals. Corolla of as many distinct petals as there are sepals, or wanting. Androecium of as many or twice as many stamens as there are sepals (only 3 in *Leptaxis*), borne on the edge or on the inner surface of the hypanthium; filaments subulate to clavate. Gynoecium of 2, or rarely 3 or 4 carpels, wholly or partially united or rarely distinct, the placentae parietal, axial or basal. Ovary partially or wholly inferior. Fruit a capsule or follicles. Seeds with fleshy endosperm.

Genera *Lepuropetalon*, *Jepsonia*, *Sullivantia*, *Saxifraga*, *Muscaria*, *Chondrosea*, *Saxifragopsis*, *Micranthes*, *Spatularia*, *Leptarrhena*, *Leptasea*, *Ocrearia*, *Heterisia*, *Peltiphyllum*, *Antiphylla* and *Astilbe* by J. K. Small.

Genera *Chrysosplenium*, *Lithophragma*, *Leptaxis*, *Tellima*, *Mitella*, *Mitellastra*, *Pectiantia*, *Ozomelis*, *Conimitella*, *Elmera*, *Heuchera*, *Tiarella*, *Bolandra*, *Hemieva*, *Suksdorfia*, *Therophon* and *Telesonix* by P. A. Rydberg.

1. Placentae parietal, sometimes nearly basal.

Flowers solitary and axillary to leaf-like bracts, or 2–4 in small corymbs each subtended by a leaf-like bract.
  Sepals, and petals, 5; stamens 10; gynoecium 3-carpellary; annual plants. — 1. Lepuropetalon.
  Sepals 4; petals wanting; stamens 4–8; gynoecium 2-carpellary; our species perennials. — 2. Chrysosplenium.
Flowers in more or less elongated racemes or panicles.
  Gynoecium of 2 or 3 equal or essentially equal carpels.
    Flower-stalk axial from a slender bulbiferous rootstock; gynoecium 3-carpellary. — 3. Lithophragma.
    Flower-stalk a lateral shoot from a stout scaly rootstock; gynoecium normally 2-carpellary.
      Inflorescence racemose.
        Petals subulate; stamens 3. — 4. Leptaxis.
        Petals linear or broader, entire, cleft or parted, or wanting; stamens 5 or 10.
          Petals pinnately cleft or pinnatifid.
            Hypanthium deeply campanulate or urn-shaped, deeper than the length of the sepals; capsule tapering into a beak. — 5. Tellima.
            Hypanthium saucer-shaped or open-campanulate, shallower than the length of the sepals; capsules abruptly beaked or beakless.
              Ovary more than half-superior; disk inconspicuous; stigmas entire.
                Stamens 10; placentae almost basal, bearing few ovules. — 6. Mitella.
                Stamens 5; placentae parietal, bearing many ovules. — 7. Mitellastra.
              Ovary wholly inferior, covered with the prominent disk; stigmas sessile, 2-lobed; stamens 5. — 8. Pectiantia.
  Petals entire, toothed or 3-cleft above; stamens 5.
    Flowering branches leafless.
      Hypanthium campanulate during anthesis; ovary half-inferior. — 9. Ozomelis.

dark-green and sometimes pilose above; involucral leaves smaller, crenate with 3 teeth; flowers several in the axils of the leaves, 5–6 mm. broad; sepals 4, purplish or becoming so, broad, orbicular; disk very prominent; seeds 6–10, shining, delicately reticulate; stamens 8.

TYPE LOCALITY: St. Paul Island, Alaska.
DISTRIBUTION: Islands of Bering Sea and coast of Alaska.
ILLUSTRATION: Proc. Biol. Soc. Wash. 7: *pl. 91.*

4. **Chrysosplenium americanum** Schweinitz; Hook. Fl. Bor. Am. 1: 242. 1832.

Chrysosplenium oppositifolium Walt. Fl. Car. 140. 1788. Not *C. oppositifolium* L. 1753.

Perennial with a slender stoloniferous rootstock; stems decumbent, forked above, glabrous or nearly so, 7–20 cm. long; lower leaves opposite, the uppermost alternate; petioles in all short; blades broadly ovate, orbicular or somewhat reniform, truncate or obtuse at the base, 4–20 mm. wide; flowers sessile, usually solitary in the axils of the leaves; sepals yellowish or purplish within; stamens usually 8.

TYPE LOCALITY: Canada.
DISTRIBUTION: In wet shaded places, Nova Scotia to Saskatchewan, south to Georgia and Minnesota.
ILLUSTRATION: Britt. & Brown, Ill. Fl. *f. 1850.*

5. **Chrysosplenium glechomaefolium** Nutt.; T. & G. Fl. N. Am. 1: 589. 1840.

Chrysosplenium oppositifolium Scouleri Hook. Fl. Bor. Am. 1: 242. 1832.
Chrysosplenium Scouleri Rose, Bot. Gaz. 23: 277. 1897.

Perennial with a slender stoloniferous rootstock; stems ascending or decumbent, slender, 1–2 dm. high, glabrous; lower leaves opposite, the upper alternate; petioles 1–2 cm. long; blades orbicular, thin, more or less cuneate at the base, 6–25 mm. wide, thin, crenate with many rounded teeth; flowers solitary in the axils of the upper leaves, short-pedicelled; sepals short and obtuse; stamens 8.

TYPE LOCALITY: Columbia River on the Northwest coast.
DISTRIBUTION: Springy places from Washington to California.

3. **LITHOPHRAGMA** Nutt. Jour. Acad. Phila. 7: 26. 1834. (*Lithofragma.*)

Pleurendotria Raf. Fl. Tell. 2: 73. 1836.

Perennial herbs with slender bulblet-bearing rootstocks and axial leafy flowering shoots. Hypanthium from campanulate or hemispheric and adnate only to the base of the gynoecium to elongated-turbinate and adnate to the lower half of the gynoecium. Sepals 5, valvate in aestivation, rounded to triangular. Petals white or rose-colored, clawed, digitately or pinnately divided, toothed or entire, much exceeding the sepals. Stamens 10, included; filaments short; anthers cordate. Gynoecium 1-celled with 3 parietal placentae, 3-valved at the apex; styles 3, short. Seeds many, horizontal.

Type species, *Tellima parviflora* Hook.

Hypanthiun campanulate, with a mostly rounded base, adnate only to the base of the ovary.
  Petals 2–7 mm. long, deeply palmately dissected; hypanthium less than 3 mm. wide.
Hypanthium not strongly striate.
  Stem-leaves seldom bulbiferous in the axils; stipules long and narrow, the free portion triangular or lanceolate, not fimbriate.
    Hypanthium with the sepals 2–3 mm. long; petals about 2 mm. long.
      Pedicels short, in fruit not exceeding the capsule in length; seeds smooth. 1. *L. tenella.*
      Pedicels in fruit much longer than the capsules; seeds muriculate. 2. *L. glabra.*
    Hypanthium with the sepals 3–4 mm. long; petals 3–5 mm. long.
      Primary divisions of the basal leaves deeply parted and again toothed; hypanthium acutish at the base. 3. *L. australis.*
      Primary divisions of the basal leaves with 3 or 4 short lobes; sepals acute; hypanthium rounded at the base. 4. *L. breviloba.*

Stem-leaves usually bulbiferous in the axils; stipules short and broad, the free portion roun dand fimbriate. 5. *L. bulbifera.*
Hypanthium strongly striate. 6. *L. rupicola.*
Petals 6–12 mm. long, entire or only 3-lobed; hypanthium more than 3 mm. wide.
Basal leaf-blades 3-parted to near the base; stem hispidulous; petals 3-lobed. 7. *L. tripartita.*
Basal leaf-blades round-lobed; stem glandular-puberulent.
Petals more or less cleft; sepals acute.
Petals 8–10 mm. long.
Petals with 5–9 obtuse or obtusish lobes and toothed at the base; leaves long-hispid. 8. *L. laciniata.*
Petals with 3–5 acute lobes; leaves short-hairy.
Petals 4–6 mm. long, the blades with a broad, usually toothed base. 9. *L. heterophylla.*
Petals 6–10 mm. long, the blades with a narrowly cuneate entire base. 10. *L. triloba.*
Petals about 12 mm. long. 11. *L. campanulata.*
Petals entire or rarely with small lateral teeth; sepals obtuse or acutish.
Petals 7–8 mm. long; basal leaf-blades rounded-crenate. 12. *L. Bolanderi.*
Petals 6 mm. long or less; basal leaf-blades more or less distinctly lobed. 13. *L. scabrella.*
Hypanthium turbinate or obconic, adnate to the lower half of the ovary.
Basal leaf-blades not divided to near the base; petals 3-lobed or entire; hypanthium short-turbinate.
Blades of the basal leaves round-lobed; lobes entire or merely crenate with very broad and rounded teeth.
Pedicels 5–10 mm. long, in fruit much exceeding the capsules; blades of the petals rhombic-oval ,entire. 14. *L. Cymbalaria.*
Pedicels 2–4 mm. long, in fruit not exceeding the capsules; blades of the petals 3-cleft, or if entire oblanceolate or spatulate.
Hypanthium not broader than long; stem-leaves small, usually with lobeddivisions. 15. *L. intermedia.*
Hypanthium broader than long; stem-leaves ample with oval crenate divisions. 16. *L. Catalinae.*
Blades of the basal leaves, or at least of some of them, 3–5-cleft; lobes often doubly crenate; petals 3-toothed.
Stipules broad, with rounded free portion; hypanthium densely glandular, scarcely striate; sepals acute. 17. *L. affinis.*
Stipules narrow, with lanceolate free portion; hypanthium sparingly glandular, striate; sepals obtuse. 18. *L. trifida.*
Basal leaf-blades divided to near the base; divisions again cleft; hypanthium elongated-obconica!.
Blades of the petals cleft scarcely half their length into 3 broadly oblong lobes. 19. *L. trifoliata.*
Blades of the petals cleft more than half their length into 3–7 linear-oblong divisions. 20. *L. parviflora.*

1. **Lithophragma tenella** Nutt.; T. & G. Fl. N. Am. 1: 584. 1840.

Tellima tenella Walp. Rep. 2: 371. 1843.

Stem slender, 1–1.5 dm. high, glandular-puberulent throughout; petioles of the basal leaves 1–1.5 cm. long, somewhat dilated below; blades less than 1 cm. broad, orbicular-flabellate in outline, broadly cuneate at the base, glandular-puberulent throughout, 3-cleft about half their length; lobes obovate-cuneate, usually 3-toothed with round teeth; stem-leaves minute, short-petioled, 3–5-toothed; stipules long and narrow, the free portion triangular to lanceolate, not fimbriate; flowers 3–6; bracts minute, ovate, scarious; pedicels about 2 mm. long; hypanthium campanulate or almost hemispherical, not striate, the base rounded and adnate to the base of the ovary, together with the sepals about 2 mm. long; petals about 2 mm. long, 3-cleft at the apex.

TYPE LOCALITY: In the central range of the Rocky Mountains, on the banks of the Big Sandy and Siskadee rivers of the Colorado of the West, about lat. 42°.
DISTRIBUTION: Rare on hills in the Rockies from Alberta to Wyoming.

2. **Lithophragma glabra** Nutt.; T. & G. Fl. N. Am. 1: 584. 1840.

Tellima glabra Steud. Nom. Bot. ed. 2. 2: 665. 1841.

Stem 1–2 dm. high, slender, minutely glandular-puberulent or nearly glabrous; petioles of the basal leaves 1.5–2 cm. long, puberulent; blades ternately divided to near the base, puberulent; divisions cuneate, 0.5–1.5 cm. long, 3-lobed; stem-leaves small, short-petioled; blades similar to those of the basal ones, without bulblets in their axils; stipules not

fimbriate, with a triangular or rounded free portion; flowers 3–8; pedicels 2–4 mm. long, in fruit often over 1 cm. long; hypanthium campanulate, puberulent, together with the sepals 2.5–3 mm. long; petals about 2 mm. long, 3-cleft at the apex.

TYPE LOCALITY: Blue Mountains of Oregon.
DISTRIBUTION: Damp soil from Oregon to Wyoming.

3. **Lithophragma australis** Rydb. sp. nov.

Lithophragma parviflora A. Gray, Bot. Ives Rep. 15. 1860. Not *L. parviflora* Nutt. 1840.

Stem stouter than in the preceding, glandular-puberulent; petioles of the lower leaves 2–5 cm. long; blades (except those of the very earliest leaves) ternately divided to near the base; divisions 1.5–2 cm. long, rhombic or cuneate, deeply cleft and again toothed; petioles of the stem-leaves 0.5–1 cm. long, not bulbiferous in their axils; stipules elongated and adnate to the petioles, the free portion ovate or triangular, not fringed; blades ternately divided to the base; divisions rhombic in outline and deeply cleft into narrow lobes; flowers 3–12; pedicels 2–5 mm. long; hypanthium campanulate, only slightly striate, together with the sepals 3–4 mm. long; petals 3–5 mm. long, broadly cuneate, deeply 3–5-cleft.

Type collected on rocky hillsides, Cedar Creek (probably Arizona), Camp 79, April 24, 1858, by J. S. Newberry in Ives' Expedition.
DISTRIBUTION: Hillsides and drier meadows; Wyoming to Utah, south to New Mexico and Arizona.

4. **Lithophragma breviloba** Rydb. sp. nov.

Stem 2–2.5 dm. high, glandular-puberulent; petioles of the basal leaves about 3 cm. long, puberulent; blades deeply ternately divided; divisions about 1 cm. long, broadly cuneate, with 3 or 4 short rounded lobes; stem-leaves more deeply cleft and with oblong lobes, short-petioled, without bulblets in their axils; stipules membranous, not fimbriate, obsolete; flowers 3–6; pedicels 3–8 mm. long; hypanthium hemispherical, rounded at the base, together with the sepals about 4 mm. long, glandular-puberulent; sepals triangular, acute; petals 3–5 mm. long, 3–5-cleft.

Type collected in Sierra County, California, by J. G. Lemmon, *no. 647*.
DISTRIBUTION: California and Arizona.

5. **Lithophragma bulbifera** Rydb. sp. nov.

Tellima tenella S. Wats. Bot. King's Expl. 95. 1871. Not *T. tenella* Walp. 1843.
Lithophragma glabra Rydb. Mem. N. Y. Bot. Gard. 1: 198, in part. 1900. Not *L. glabra* Nutt.

Stem 1–2 dm. high, glandular-puberulent; petioles of the basal leaves 2–5 cm. long, puberulent; blades ternately divided to near the base; divisions 0.5–1 cm. (seldom 1.5 cm.) long, cuneate or obovate, 3-cleft and the lobes often toothed; stem-leaves small, short-petioled, similar to the basal ones, usually bearing bulblets in their axils; stipules short, membranous, usually pinkish; free portion rounded and fimbriate; flowers 3–6, sometimes replaced by bulblets; pedicels 3–5 mm. long, or in fruit even 1 cm. long; hypanthium campanulate, together with the sepals 3–4 mm. (in fruit sometimes 5 mm.) long; petals 4–7 mm. long, 3–5-cleft, white or sometimes rose-colored.

Type collected on the continental divide, at an altitude of 3,000–3,300 meters, at Battle, Carbon County, Wyoming, by F. Tweedy, *no. 4411*.
DISTRIBUTION: Common on dry hills, from the Black Hills of South Dakota and Montana to British Columbia, and south to Colorado and California.

6. **Lithophragma rupicola** Greene, Erythea 3: 102. 1895.

Stems 2–4 dm. high, hispidulous-scabrous throughout; basal leaves long-petioled, with bulblets in their axils; blades 2–3 cm. in diameter, reniform in outline, 3–5-lobed to near the base; divisions rhombic or cuneate, 3-cleft and often again toothed; stem-leaves smaller, doubly cleft into narrow divisions; raceme elongated, 12–20-flowered; hypanthium campanulate or hemispherical, strongly 10-striate, together with the sepals 3–4 mm. long; petals white, deeply palmatifid.

TYPE LOCALITY: Lava beds of Modoc County, California.
DISTRIBUTION: Known only from the type locality.

7. **Lithophragma tripartita** Greene, Erythea 3: 102. 1895.

Tellima tripartita Greene, Erythea 1: 106. 1893.
? *Lithophragma austromontana* Heller, Muhlenbergia 2: 53. 1905.

Stem slender, 2–3 dm. high, hispidulous or the upper portion glandular-puberulent; petioles of the basal leaves 3–5 cm. long, also hispidulous; blades hirsute, ternately cleft to near the base into obovate-cuneate divisions, which are 1–1.5 cm. long and 2–5-toothed at the apex; stem-leaves 1 or 2, similar but somewhat smaller; flowers 3–6; pedicels 3–5 mm. long; hypanthium turbinate-campanulate, together with the sepals about 4 mm. long and 4 mm. wide; sepals ovate, acute; petals 6–8 mm. long, 3-cleft or 3-toothed at the apex or the upper rarely entire.

TYPE LOCALITY: In the mountains of San Diego County, California, near San Jacinto.
DISTRIBUTION: San Jacinto Mountains, California.

8. **Lithophragma laciniata** Eastwood, sp. nov.

Stem stout, branched at the base, 3–5 dm. high, rough with stiff glandular hairs; petioles of the basal leaves stout, about 5 cm. long, glandular-hirsute, not bulbiferous in the axils; blades broadly reniform, 2–4 cm. broad, coarsely crenate with broad rounded callous-apiculate teeth, coarsely hirsute on both sides; stem-leaves usually petioled, 3–5-lobed with crenate or dentate divisions; stipules narrow, erosely ciliate; flowers several; pedicels shorter than the hypanthium; bracts very small, membranous, erose; hypanthium campanulate, adnate only at the base, together with the triangular sepals about 6 mm. long; petals 6–8 mm. long, white, the blades oblong in outline, obtusely laciniate with 5–9 lobes and pectinately toothed at the broad base.

Type collected at Marysville, Butte County, California, in 1893, by J. W. Blankinship.

9. **Lithophragma heterophylla** (H. & A.) T. & G. Fl. N. Am. 1: 584. 1840.

Tellima heterophylla H. & A. Bot. Beech. Voy. 346. 1838.

Stem usually tall, 2–5 dm. high, glandular-pubescent or somewhat hispidulous below; petioles of basal leaves 3–6 cm. long, puberulent; blades reniform, rounded, 3-lobed and crenate, 1.5–3.5 cm. wide, more or less hirsute; stem-leaves 1–5, petioled, deeply 3-cleft and again cleft or toothed; raceme 3–8-flowered; pedicels 1–2 mm. long; hypanthium campanulate, together with the sepals 4–5 mm. long and almost as wide; sepals triangular, acutish; petals 4–6 mm. long, 3–5-lobed at the apex, and usually toothed at the broad base.

TYPE LOCALITY (In the original publication no locality is given, but subsequently in Torrey and Gray's Flora is given): In shady places, Santa Barbara, California.
DISTRIBUTION: Shaded places, cañons and ravines, California.

10. **Lithophragma triloba** Rydb. sp. nov.

Lithophragma heterophylla T. & G. Fl. N. Am. 1: 584, in part, *i. e.*, as to Nuttall's specimens. 1840.

Stem usually tall, 3–5 dm. high, glandular-pubescent or puberulent; petioles of the basal leaves 3–5 cm. long, glandular-pubescent; blades reniform, 1–3 cm. wide, indistinctly 3–5-lobed and coarsely crenate, hispidulous on both sides; stem-leaves short-petioled; blades 3–5-lobed or divided and with ovate teeth; stipules narrow, ciliate; raceme lax; hypanthium broadly campanulate, together with the triangular sepals about 5 mm. long; petals white, 5–10 mm. long, the blades 3-cleft at the apex and tapering below into a cuneate entire base.

Type collected in the Santa Lucia Mountains, Monterey County, California, in 1898, by R. A. Plaskett.
DISTRIBUTION: Central and southern California.

11. **Lithophragma campanulata** Howell, Fl. NW. Am. 200. 1898.

Stem slender, 3–5 dm. high, glandular-puberulent above, pubescent below; petioles of basal leaves long, with bulblets in the axils; blades rounded-cordate, 3-lobed, 2.5–3.5 cm. in diameter, the lobes coarsely 3–5-toothed; stem-leaves usually solitary, similar but more

deeply lobed; flowers few; hypanthium campanulate, together with the sepals 6–8 mm. long; sepals triangular, acute; petals white or pink, about 12 mm. long, 3–5-cleft.

TYPE LOCALITY: On high open ridges of the Siskiyou mountains near the Oregon boundary.
DISTRIBUTION: Known only from the type locality.

12. **Lithophragma Bolanderi** A. Gray, Proc. Am. Acad. **6**: 535. 1865.

Tellima Bolanderi A. Gray, Bot. Calif. 1: 198. 1876.

Stem tall, 3–6 dm. high, glandular-puberulent; petioles of basal leaves 4–6 cm. long, puberulent; blades reniform, indistinctly lobed and sparingly hirsutulous; stem-leaves several, with bulblets in their axils, the upper deeply divided into narrow divisions; flowers 5–8; pedicels 2–3 mm. long; hypanthium campanulate, striate, together with the sepals 4–5 mm. long; sepals triangular-ovate, acutish; petals white, 7–8 mm. long, with slender claws and oval or oblong blades, which are entire or rarely slightly dentate.

TYPE LOCALITY: California, in a shady ravine, southeast of Monte Diablo.
DISTRIBUTION: Damp places, central and southern California.

13. **Lithophragma scabrella** Greene, Erythea **3**: 102. 1895.

Tellima scabrella Greene, Pittonia **2**: 162. 1891.

Stem slender, 2–4 dm. high, glandular-scabrous; petioles of basal leaves 2–4 cm. long, glandular-puberulent, often bulbiferous in the axils; blades reniform, 1–2 cm. broad, glandular-hirsute, usually divided into 3–5 rounded lobes which are more or less crenate; stem-leaves divided to near the base into narrower divisions; flowers 3–6; pedicels 2–5 mm. long; hypanthium campanulate, together with the sepals about 5 mm. long and 4 mm. wide; sepals ovate, acutish; petals about 6 mm. long, with long claws and rhombic-ovate entire blades; styles manifest and slightly exserted; seeds muriculate.

TYPE LOCALITY: Pine woods south of Tehachapi, California.
DISTRIBUTION: Central California.

14. **Lithophragma Cymbalaria** T. & G. Fl. N. Am. **1**: 585. 1840.

Tellima Cymbalaria Steud. Nom. Bot. ed. 2. **2**: 665. 1841.

Stem slender, 1.5–3 dm. high, finely glandular-puberulent; petioles of basal leaves 2–5 cm. long, finely puberulent; blades reniform, 3–5-lobed; lobes rounded, crenate with broad and round teeth or entire; stem-leaves usually opposite, once or twice ternately divided, with narrow lobes; flowers 3–6; pedicels 5–10 mm. long; hypanthium short-turbinate, together with the sepals 3–6 mm. long; sepals triangular, acute; petals 6–9 mm. long, with slender claws and rhombic-oval, entire blades.

TYPE LOCALITY: Shady woods near Santa Barbara, California.
DISTRIBUTION: Southern California, near the coast.

15. **Lithophragma intermedia** Rydb. sp. nov.

Stems 3–5 dm. high, finely glandular-pubescent; petioles of basal leaves 2–6 cm. long; blades reniform, 1–3.5 cm. wide, rounded, 3–5-lobed, more or less hirsutulous; lobes usually crenate with 2–4 broad teeth; stem-leaves 2 or 3, alternate; stipules broad and fimbriate; blades ternately divided with cuneate, lobed divisions; flowers 3–6; pedicels 2–4 mm. long; hypanthium short-turbinate, together with the sepals 5–6 mm. long; sepals triangular, acute; petals 5–8 mm. long, 3-cleft at the apex, or entire and then with oblanceolate or spatulate blades.

Type collected in Los Angeles County, California, in 1892, by H. E. Hasse.
DISTRIBUTION: Moist grassy slopes, southern California and northern Lower California.

16. **Lithophragma Catalinae** Rydb. sp. nov.

Stem about 3 dm. high, sparingly glandular-pubescent; petioles of basal leaves about 5 cm. long, more or less glandular-hairy; blades reniform, 3–4.5 cm. wide, sparingly pubescent, thin, indistinctly 3–5-lobed and crenate with very broad rounded or truncate teeth; stem-leaves with short petioles, which are more or less dilated, and broad fimbriate stipules; blades deeply 3-cleft with broadly oval, crenate divisions; hypanthium broadly obconic,

3–3.5 mm. broad, 2.5–3 mm. high, or with the sepals about 4 mm. high; sepals triangular; petals 7–8 mm. long; blades usually 3-cleft, with rather short, very acute lateral lobes.

Type collected in shade of mountains at Avalon, Santa Catalina Island, California, by Mrs. Blanche Trask.

DISTRIBUTION: Santa Catalina Island.

17. **Lithophragma affinis** A. Gray, Proc. Am. Acad. **6**: 534. 1865.

Tellima affinis A. Gray, Bot. Calif. 1: 198. 1876.

Stems stout, 3–5 dm. high, rather densely glandular-hirsutulous; petioles of basal leaves 4–8 cm. long; blades reniform in outline, 1.5–3 cm. broad, at least some of them ternately or quinately divided, hirsutulous; divisions orbicular-ovate, doubly ternately lobed or crenate; stem-leaves 1–3, alternate; stipules broad and fimbriate; petioles 1–2 cm. long; blades ternately divided to near the base into cuneate, twice ternately cleft divisions; flowers 6–12; pedicels 2–8 mm. long; hypanthium turbinate, together with the sepals 5–8 mm. long; sepals ovate, acute; petals 7–10 mm. long, very broad and 3-lobed at the apex with almost equal lobes.

TYPE LOCALITY: California, around and north of San Francisco.

DISTRIBUTION: Rocky shady places in the mountains, from southern Oregon to southern California.

18. **Lithophragma trifida** Eastwood, sp. nov.

Stem slender, 3–4 dm. high, with 1 or 2 leaves below the middle, glandular-hispidulous; petioles of basal leaves slender, 2–6 cm. long, sparingly hairy; blades reniform, 1–2 cm. broad, more or less distinctly 3–5-lobed and crenate with broad rounded callous-tipped teeth; stem-leaves deeply divided into 3 crenate toothed or lobed divisions; stipules narrow, lanceolate, fimbriate; raceme lax; flowers 3–7; pedicels in fruit longer than the flowers; hypanthium campanulate-turbinate, its lower half or less adnate, together with the ovate obtuse sepals 4–5 mm. long; petals white, about 7 mm. long, clawed; blades 3-cleft with acuminate lobes, the middle lobe elongated.

Type collected near Sweetwater Dam, San Diego County, California, by Miss Alice Eastwood.

DISTRIBUTION: Known only from the type locality.

19. **Lithophragma trifoliata** Eastw. Bull. Torrey Club **32**: 200. 1905.

Stem stout, 2–3 dm. high, decidedly hirsute throughout; petioles of the basal leaves 2–5 cm. long, also hirsute; blades decidedly hirsute, 1–2 cm. wide, divided to the base into 3–5 broadly rhombic divisions; these deeply ternately cleft and again 3-lobed; stem-leaves similar; stipules broad, fimbriate; raceme short, 5–8-flowered; bracts rather conspicuous; pedicels short; hypanthium densely hirsute, elongated-obconic, together with the sepals 7–8 mm. long and 2.5–3 mm. wide; sepals lanceolate, acute; petals very broad, 8–10 mm. long, with 3 broadly oblong or ovate lobes.

TYPE LOCALITY: Foothills near Chico, Butte County, California.

DISTRIBUTION: Mountain regions of California.

20. **Lithophragma parviflora** (Hook.) Nutt.; T. & G. Fl. N. Am. **1**: 584. 1840.

Tellima parviflora Hook. Fl. Bor. Am. 1: 239. 1832.
Pleurendotria parviflora Raf. Fl. Tell. 2: 73. 1836.
Pleurendotria reniformis Raf. Fl. Tell. 2: 74. 1836.
? *Lithophragma parviflora micrantha* T. & G. *loc. cit.*

Stem 1–3 dm. high, glandular-puberulent and somewhat hirsutulous; petioles 2–6 cm. long; blades more or less hirsutulous, divided to the base into 3–5 divisions; these 1–3 cm. long, twice ternately cleft into oblong or linear divisions; stem-leaves 2 or 3, similar; raceme short, 3–8-flowered; pedicels 2–4 mm. long; hypanthium elongated-obconic, together with the sepals 5–8 mm. long; petals deeply 3–5-cleft into narrowly oblong divisions.

TYPE LOCALITY: North California.

DISTRIBUTION: In rocky or gravelly places, Alberta to British Columbia, south to Colorado and California.

ILLUSTRATIONS: Hook. Fl. Bor. Am. *pl. 78 A;* G. Don, Gen. Hist. 3: *f. 49.*

4. **LEPTAXIS** Raf. Fl. Tell. 2: 75. 1836.

Tolmiea T. & G. Fl. N. Am. 1: 582. 1840.

Perennial herbs with a scaly rootstock and lateral leafy flowering branches. Stipules present, membranaceous. Hypanthium funnelform, free from the ovary, in fruit splitting on one side, slightly irregular. Sepals 5, ascending. Petals 5, subulate and persistent. Stamens 3, opposite the upper 3 sepals; filaments short; cells of the anthers confluent. Gynoecium 1-celled, attenuate and slightly stipitate at the base, with 2 long beaks; placentae parietal, many-seeded.

Type species, *Heuchera Menziesii* Hook.

1. **Leptaxis Menziesii** (Pursh) Raf. Fl. Tell. 2: 76. 1836.

Tiarella Menziesii Pursh, Fl. Am. Sept. 313. 1814.
Heuchera Menziesii Hook. Fl. Bor. Am. 1: 237. 1832.
Tolmiea Menziesii T. & G. Fl. N. Am. 1: 582. 1840.

Main stem none or nearly so; flowering branches 5–8 dm. high, sparingly hirsute, leafy; petioles of basal leaves 1–2 dm. long, also hirsute; blades cordate with triangular lobes and teeth, sparingly hirsute, very thin, 5–10 cm. wide; leaves of the flowering branches similar but smaller; bracts small, lanceolate; hypanthium cylindro-campanulate, oblique, about 8 mm. long, greenish, tinged with purple; sepals ovate-oblong with spreading obtuse tips; petals subulate-filiform, about twice as long as the sepals; stamens slightly exserted. Adventitious buds are often formed in the sinuses of the leaf-blades.

TYPE LOCALITY: On the northwest coast (of America).
DISTRIBUTION: Along mountain streams from British Columbia to northern California.
ILLUSTRATIONS: Hook. Fl. Bor. Am. *pl. 80*; Baillon, Hist. Pl. 3: *f. 373*; E. & P. Nat. Pfl. 3^{2a}: *f. 29, O–S*.

5. **TELLIMA** R. Br. in Frankl. Journey 765. 1823.

Coarse hirsute perennials with thick scaly rootstock and axillary leafy flowering shoots. Stipules present but small. Hypanthium urn-shaped or deeply campanulate, adnate only to the base of the gynoecium. Sepals ovate, erect, valvate in bud. Petals white or tinged with purple, spreading, with a cuneate claw and pinnately divided blade. Stamens 10, short, included; anthers 2-celled. Gynoecium 1-celled with 2 parietal many-seeded placentae; styles 2; stigma capitate. Capsule opening between the beaks. Seeds horizontal.

Type species, *Mitella grandiflora* Pursh.

Hypanthium cylindro-campanulate with a turbinate base; claws of the petals broadly cuneate; flowers not fragrant.
- Tube of hypanthium much longer than the broadly ovate sepals. 1. *T. grandiflora*.
- Tube of the hypanthium scarcely longer than the oblong sepals. 2. *T. breviflora*.

Hypanthium turbinate-campanulate; claws of the petals narrow; flowers fragrant. 3. *T. odorata*.

1. **Tellima grandiflora** (Pursh) Dougl. Bot. Reg. *pl. 1178*. 1828.

Mitella grandiflora Pursh, Fl. Am. Sept. 314. 1814.
Tiarella alternifolia Fisch.; Seringe, in DC. Prodr. 4: 50. 1830.

Main stem none; flowering branches 3–6 dm. high, hirsute with long hairs, glandular above, leafy; petioles of basal leaves 1–2 dm. long, hirsute; blades reniform or cordate, sparingly hirsute, round-lobed and toothed with broadly ovate teeth, 4–10 cm. broad; leaves of the flowering branches short-petioled with more or less developed stipules; hypanthium glandular-puberulent, cylindro-campanulate with a turbinate base, about 8 mm. long; sepals ovate, about 3 mm. long; petals white, purplish or pink; claws broadly cuneate, 1.5–2 mm. long, erect; blades spreading or reflexed, with a rounded ovate body and subulate-filiform lobes; ovary adnate to the hypanthium only at the base.

TYPE LOCALITY: On the northwest coast (of America).
DISTRIBUTION: In rich, moist woods and crevices of rocks from southern Alaska to northern California.
ILLUSTRATIONS: Bot. Reg. *pl. 1178*; Baillon, Hist. Pl. 3: *f. 368*; E. & Nat. P. Pfl. 3^{2a}: *f. 29, T–V*.

2. **Tellima breviflora** Rydb. sp. nov.

Stem none; flowering branches 4–5 dm. high, more or less glandular-hirsute, leafy; petioles of basal leaves 1–1.5 dm. long, reflexed-hirsute; blades usually cordate, with a

deep sinus, 5–8 cm. long, sparingly hirsute, with broadly ovate lobes and teeth; hypanthium glandular-puberulent, campanulate with a turbinate base, about 5 mm. long; sepals oblong, acutish, about 3 mm. long; petals greenish-white or purplish, the claws broadly cuneate with round lobes at the summit, erect, the blades spreading with a lanceolate body and subulate lobes.

Type collected on Sykes Creek, near Wisner, Oregon, in 1892, by E. W. Hammond, *no. 128.*
DISTRIBUTION: Near streams from British Columbia and Alaska to northern California.

3. **Tellima odorata** Howell, Fl. NW. Am. 199. 1898.

Closely resembling the preceding in habit; flowering branches and petioles more coarsely hirsute with reflexed hairs; flowers fragrant; hypanthium of a lighter color, turbinate-campanulate, 5–6 mm. long, minutely glandular-puberulent; petals with a narrower claw and broader limb; ovary adnate to the hypanthium for half its length.

TYPE LOCALITY: Along the Columbia River near the Cascades.
DISTRIBUTION: In wet places and springs, Oregon.

6. **MITELLA** (Tourn.) L. Sp. Pl. 406. 1753.

Low perennials with scaly rootstock and lateral flowering branches. Inflorescence racemose. Hypanthium saucer-shaped or open-campanulate, adnate to the base of the gynoecium. Sepals triangular or ovate, valvate in aestivation. Petals 5, pectinately pinnatifid. Stamens 10, included; filaments short, subulate. Gynoecium mostly superior, 1-celled, with 2 parietal placentae, ovuliferous only at the base; styles distinct, short; stigma obtuse, simple. Capsule 2-valved at the summit, few-seeded.

Type species, *Mitella diphylla* L.

Stem-leaves opposite.
- Stem-leaves sessile; sepals triangular-ovate; divisions of the petals subulate. — 1. *M. diphylla.*
- Stem-leaves petioled; sepals lanceolate; divisions of the petals filiform. — 2. *M. oppositifolia.*

Stem-leaves alternate, single, or none.
- Leaf-blades (except the earliest) cordate, with acute lobes; divisions of petals subulate; stem-leaves usually present. — 3. *M. intermedia.*
- Leaf-blades reniform, round-lobed; divisions of the petals filiform; stem-leaves usually wanting. — 4. *M. nuda.*

1. **Mitella diphylla** L. Sp. Pl. 406. 1753.

Perennial with a usually branching rootstock; flowering branches slender, 2–4.5 dm. high, puberulent and with a few longer scattered hairs, with a pair of almost opposite leaves; petioles of the basal leaves 5–15 cm. long, sparingly retrorse-hairy; blades broadly cordate, 3–7 cm. long, thin, 3–5-lobed and dentate, with scattered hairs on both sides; stem-leaves sessile, cordate or ovate, 3-lobed and dentate; raceme slender, 1–2 dm. long, lax; bractlets minute; flowers about 5 mm. wide; hypanthium between campanulate and saucer-shaped, greenish; sepals ovate, whitish; petals white, pinnately divided; filaments very short; anthers oblong.

TYPE LOCALITY: North America.
DISTRIBUTION: In rich woods from Quebec to Minnesota south to North Carolina and Missouri.
ILLUSTRATIONS: Hill, Veg. Syst. *pl. 32, f. 1;* Gaertn. Fruct. **1**: *pl. 44, f. 6,* Lam. Tab. Encyc. *pl. 373, f. 1;* Schkuhr, Handb. **1**: *pl. 120;* Bot. Reg. **2**: *pl. 166;* Barton, Fl. N. Am. *pl. 89;* Britt. & Brown, Ill. Fl. *f. 1848;* E. & P. Nat. Pfl. 3^{2a}: *f. 29, W–X.*

2. **Mitella oppositifolia** Rydb. sp. nov.

Perennial with a branching rootstock; flowering branches sparingly pubescent with retrorse hairs, with a pair of opposite leaves; basal leaves numerous; petioles about 8 cm. long, retrorse-hairy; blades broadly cordate, about 5 cm. long, finely puberulent above, hirsute on the veins beneath, somewhat 3-lobed and dentate; stem-leaves petioled; petioles about 1.5 cm. long; blades cordate, 3-lobed, about 5 cm. long, dentate, acute; hypanthium nearly saucer-shaped, whitish with prominent ribs; sepals lanceolate, greenish; petals pinnately divided with filiform divisions; filaments short; anthers oval.

Type collected at South Hadley, Massachusetts, by A. S. Kinney.

3. **Mitella intermedia** Bruhin, sp. nov.

Perennial with a slender rootstock, and in late summer producing runners; flowering branches 1–2 dm. high with 1 or 2 alternate leaves, sparingly hairy; petioles of the basal leaves 3–6 cm. long, sparingly hairy; blades of the earlier leaves rounded-reniform, doubly crenate, those of the later cordate with broad triangular lobes and toothed, sparingly hairy on both sides, acute; stem-leaves similar, but smaller and more acute, subsessile; raceme 6–10-flowered; hypanthium between bell-shaped and saucer-shaped, yellowish inside; calyx 4–5 mm. wide; sepals triangular-ovate, whitish; petals white, pinnately divided with subulate divisions, about twice as long as the sepals; filaments subulate, about half as long as the sepals.

Type collected near the shore of Lake Michigan, one mile northward from Centerville, Wisconsin, by T. A. Bruhin.

DISTRIBUTION: Wisconsin.

4. **Mitella nuda** L. Sp. Pl. 406. 1753.

Tiarella unifolia Retz. Obs. **3**: 30. 1783.
Mitella reniformis Lam. Tab. Encyc. **2**: 495. 1793.
Mitella prostrata Michx. Fl. Bor. Am. **1**: 270. 1803.

Perennial with a slender branched rootstock and producing long runners late in the summer; flowering branches scapiform, naked, or rarely with a small leaf, 0.5–2 dm. high, sparingly hairy; petioles of the basal leaves 2–8 cm. long, sparingly hairy; blades reniform, 2–5 cm. in diameter, rounded-crenate or slightly round-lobed, with scattered hairs on both sides; raceme lax and few-flowered; hypanthium flat, saucer-shaped; calyx about 6 mm. wide; sepals yellowish-green, triangular-ovate; petals about twice as long as the sepals, pinnately divided, with filiform divisions; filaments subulate, more than half as long as the sepals.

TYPE LOCALITY: Northern Asia.

DISTRIBUTION: In cold woods and peat-bogs, from Labrador and Newfoundland to Mackenzie and British Columbia, south to Pennsylvania and Montana; also eastern Asia.

ILLUSTRATIONS: Lam. Tab. Encyc. *pl. 373. f. 2* and *3;* Baillon, Hist. Pl. **3**: *f. 369;* Britt. & Brown, Ill. Fl. *f. 1849.*

7. **MITELLASTRA** (T. & G.) Howell, Fl. NW. Am. 201. 1898.

Mitella § *Mitellastra* T. & G. Fl. N. Am. **1**. 586. 1840.

Slender glandular pubescent perennials with scaly rootstocks and lateral leafy flowering shoots. Inflorescence racemose. Hypanthium saucer-shaped, adnate only to the base of the gynoecium. Sepals 5, triangular, valvate in aestivation. Petals pectinately pinnatifid with filiform divisions. Stamens 5, opposite the sepals; filaments slender, about two thirds as long as the sepals. Gynoecium almost wholly superior with 2 parietal many-ovuled placentae. Styles 2, distinct, slender, tapering into the stigmas. Capsule as in *Mitella*.

Type species, *Mitella caulescens* Nutt.

1. **Mitellastra caulescens** (Nutt.) Howell, Fl. NW. Am. 201. 1898.

Mitella caulescens Nutt.; T. & G. Fl. N. Am. **1**: 586. 1840.

Perennial with a short rootstock and summer runners; flowering branches 1–3-leaved, puberulent and somewhat hirsute, 1.5–3 dm. high; petioles of the basal leaves 5–10 cm. long, hirsute with reflexed hairs; blades broadly cordate or reniform, 5–7-lobed with triangular-ovate lobes and crenate with mucronate teeth, thin, hirsute on both sides, 3–5 cm. broad; stem-leaves similar but short-petioled, alternate; flowers yellowish-green; hypanthium saucer-shaped, together with the calyx about 5 mm. wide; sepals broadly triangular; petals pectinately pinnatifid; stamens opposite the sepals and almost equaling them; filaments subulate, purple; stigmas elongated, simple; upper part of ovary free.

TYPE LOCALITY: Shady woods of the Oregon, near the mouth of the Willamette.

DISTRIBUTION: Damp places especially along brooks, from Montana to British Columbia and south to western Idaho and northern California.

8. **PECTIANTIA** Raf. Fl. Tell. **2**: 72. 1836.

Drummondia DC. Prodr. **4**: 49. 1830. Not *Drummondia* Hook. 1828.
Mitellopsis Meissn. Pl. Vasc. Gen. 136, in part. 1838.

Low perennials with scaly rootstocks and lateral, scapiform flowering branches. Inflorescence racemose. Hypanthium saucer-shaped, wholly adnate to the depressed ovary. Sepals 5, triangular or ovate, reflexed, valvate in aestivation. Petals 5, pectinately pinnatifid with filiform divisions. Stamens 5, inserted on the margin of a distinct disk which covers the ovary; filaments very short, inflexed; anthers reniform. Gynoecium 1-celled, depressed, mostly inferior, with 2 parietal but almost basal placentae. Stigmas 2, subsessile, 2-lobed at the apex. Seeds numerous.

Type species, *Drummondia mitelloides* DC., which was based on *Mitella pentandra* Hook.

Stamens opposite to the petals.
- Calyx 3–3.5 mm. wide; petioles glabrous or sparingly white-hairy. 1. *P. pentandra.*
- Calyx about 5 mm. wide; petioles coarsely reflexed-hairy with long brown hairs. 2. *P. latiflora.*

Stamens opposite to the sepals.
- Leaf-blades reniform. 3. *P. Breweri.*
- Leaf-blades oval with a cordate base. 4. *P. ovalis.*

1. **Pectiantia pentandra** (Hook.) Rydb.

Mitella pentandra Hook. Bot. Mag. *pl. 2933.* 1829.
Drummondia mitelloides DC. Prodr. **4**: 50. 1830.
Pectiantia mitelloides Raf. Fl. Tell. **2**: 72. 1836.
Mitellopsis Drummondia Meissn. Pl. Vasc. Gen. Comm. 100. 1838.
Mitellopsis pentandra Walp. Rep. **2**: 370. 1843.

Perennial with a short rootstock; flowering branches scapiform, naked, 1–3 dm. high, minutely glandular-puberulent; petioles of the basal leaves 5–10 cm. long, sparingly puberulent or with a few reflexed hairs, or glabrate; blades broadly cordate, coarsely crenate and with 9–11 more or less distinct round lobes, thin, 3–6 cm. in diameter, sparingly hairy on both sides; raceme lax, with the flowers not rarely in pairs; hypanthium saucer-shaped, together with the calyx 3–3.5 mm. wide, green, often purplish inside; sepals broadly triangular-ovate, obtuse and recurved; petals pectinately pinnatifid with filiform divisions and rachis; stamens 5, opposite the petals; filaments very short and anthers reniform.

TYPE LOCALITY: Moist alpine woods in the Rocky Mountains.
DISTRIBUTION: On mossy banks of streams and in bogs in the mountain regions from Alberta to Alaska and south to Colorado and California.
ILLUSTRATIONS: Bot. Mag. *pl. 2933;* Baillon, Hist. Pl. **3**: *f. 370;* G. Don, Gen. Hist. **3**: *f. 50;* E. & P. Nat. Pfl. 3^{2a}: *f. 29, Y–Z.*

2. **Pectiantia latiflora** Rydb. sp. nov.

Perennial, with a slender rootstock; flowering stems 1–2 dm. high, naked and scapelike, as well as the petioles more or less pubescent with long reflexed brown hairs; blades broadly cordate, with 7–9 broadly triangular lobes and sharply crenate, 3–6 cm. wide, decidedly hairy on both sides with long hairs; hypanthium and calyx about 5 mm. broad; petals pectinately pinnatifid with filiform divisions but a broader rachis; otherwise as *P. pentandra.*

Type collected at Palace Camp, Washington, by Mrs. Bailey Willis.
DISTRIBUTION: Swamps in the mountains of Washington.

3. **Pectiantia Breweri** (A. Gray) Rydb.

Mitella Breweri A. Gray, Proc. Am. Acad. **6**: 533. 1865.

Perennial with a rather slender rootstock; flowering branches 1–2 dm. high, scapiform, leafless, very sparingly hairy; petioles of the basal leaves 5–10 cm. long, retrorse-hirsute especially on the upper part; blades reniform with many shallow rounded lobes and serrate-crenate, thin, sparingly hairy on both sides or glabrous, 4–7 cm. broad; flowers green, occasionally in pairs; hypanthium saucer-shaped, together with the calyx 3–4 mm.

wide; sepals very broadly ovate, obtuse, reflexed; petals pectinately pinnatifid with filiform divisions; stamens 5, opposite the sepals; filaments short.

TYPE LOCALITY: Mount Hoffman, in a damp place, at the elevation of about 3,300 meters.
DISTRIBUTION: In damp woods in the mountains, from Alberta and British Columbia south to western Idaho and central California.

4. **Pectiantia ovalis** (Greene) Rydb.

Mitella ovalis Greene, Pittonia 1: 32. 1887.
Mitella Hallii Howell, Erythea 3: 33. 1895.

Perennial with a cespitose rootstock; flowering branches 1–3 dm. high, scapiform, leafless, hirsute with reflexed long hairs; petioles of the basal leaves 3–7 cm. long, densely retrorse-hirsute; blades oval with a cordate base, only the earliest reniform, with 5–9 rounded shallow lobes and crenate with very broad teeth, coarsely hirsute on both sides, 2–5 cm. long, 1.5–3 cm. wide; flowers yellowish-green, often in pairs or sometimes even in threes; hypanthium saucer-shaped, together with the calyx 2–3 mm. wide; sepals broadly triangular, somewhat reflexed; stamens 5, opposite the sepals; filaments very short.

TYPE LOCALITY: Mendocino County, California.
DISTRIBUTION: In wet places from British Columbia to northern California.

9. **OZOMELIS** Raf. Fl. Tell. **2**: 73. 1836.

Mitellopsis § *Mitellina* Meissn. Pl. Vasc. Gen. 136. 1838.

Perennials with scaly rootstocks and lateral scapiform flowering shoots. Inflorescence racemose. Hypanthium campanulate, adnate to the lower half of the ovary. Sepals 5, ovate or oblong, erect, valvate in aestivation. Petals 5, 3-cleft, toothed or entire, or lacking. Stamens 5 (or in one species occasionally replaced by staminodia), opposite to the sepals; disk obsolete; filaments short, erect; anthers reniform. Gynoecium half-inferior, 1-celled with 2 parietal many-ovuled placentae; styles 2, very short; stigmas capitate.

Type species, *Mitella trifida* Hook. (*M. trifida* Graham.)

Petals present.
- Leaf-blades angularly lobed. — 1. *O. diversifolia.*
- Leaf-blades round-reniform, not angularly lobed.
  - Mid-veins of the sepals branched; side-veins simple; petals cuneate or oblanceolate, with lanceolate lobes or entire.
    - Petals cuneate, 3-fid with subequal divisions.
      - Hypanthium turbinate-campanulate, together with the sepals 2.5–3 mm. long; petals about 2 mm. long, half longer than the oblong sepals, or longer. — 2. *O. pacifica.*
      - Hypanthium hemispherical, together with the sepals 1.5–2 mm. long; petals about 1.5 mm. long, slightly exceeding the ovate sepals. — 3. *O. trifida.*
    - Petals oblanceolate, slightly exceeding the sepals, entire or slightly and unequally toothed. — 4. *O. violacea.*
  - Mid-veins of the sepals simple.
    - Petals filiform or 3-fid with filiform divisions, 1-nerved; lateral veins of the sepals branched.
      - Petals 3-fid to the middle; hypanthium with the sepals 3–5 mm. long. — 5. *O. stauropetala.*
      - Petals entire or 3-fid only at the apex; hypanthium with the sepals 1.5–3 mm. long.
        - Hypanthium with sepals 2–3 mm. long; leaf-blades indistinctly lobed and with shallow crenulations; petals often entire. — 6. *O. stenopetala.*
        - Hypanthium with sepals 1.5–2 mm. long; leaf-blades distinctly lobed and deeply crenate; petals 3-cleft. — 7. *O. Parryi.*
    - Petals oblanceolate, entire, 3-nerved; hypanthium with the sepals 1.5 mm. long. — 8. *O. micrantha.*

Petals none; staminodia sometimes replacing the stamens. — 9. *O. anomala.*

1. **Ozomelis diversifolia** (Greene) Rydb.

Mitella diversifolia Greene, Pittonia 1: 32. 1887.
Mitella diversiloba Piper, Erythea 7: 162. 1899.

Perennial with a short rootstock; flowering branches 2–3 dm. high, glandular-puberulent, leafless or rarely with a small leaf; petioles of the basal leaves 3–6 cm. long, sparingly retrorse-hirsute; blades cordate, angularly lobed, scarcely crenate, 3–5 cm. long, ciliate on the margin; racemes not secund, short; flowers almost sessile; hypanthium turbinate-campanu-

late, together with the sepals 2 mm. long; sepals whitish, acute, the midvein simple, the lateral veins branched; petals about half longer than the sepals, abruptly widened and 3-cleft at the apex; stamens 5, opposite the sepals; filaments very short.

TYPE LOCALITY: Summit of Trinity Mountains, California.
DISTRIBUTION: Wet places, Washington to California.

2. **Ozomelis pacifica** Rydb. sp. nov.

Mitella trifida Piper, Erythea 7: 160, in part. 1899. Not *M. trifida* Graham.

Perennial with a short erect rootstock; flowering branches about 3 dm. high, glandular-puberulent and usually sparingly hirsute; petioles of the basal leaves 5–7 cm. long, sparingly retrorse-hirsute; blades reniform or broadly cordate in outline, 2–5 cm. wide, indistinctly lobed, or rather doubly crenate, with fine rounded mucronate teeth, very sparingly hirsute and ciliate; racemes 5–10-flowered, more or less secund; pedicels very short; hypanthium turbinate-campanulate, together with the sepals 2.5–3 mm. long; sepals yellowish-green, oblong, merely spreading.

Type collected in the Olympic Mountains, Challam County, Washington, in 1900, by A. D. E. Elmer, *no. 2778*.

DISTRIBUTION: Mountains of western Washington to northern California.

3. **Ozomelis trifida** (Graham) Rydb.

Mitella trifida Graham, Edinb. New Phil. Jour. 1829: 185. 1829.
Ozomelis varians Raf. Fl. Tell. 2: 73. 1836.
Mitellopsis Hookeri Meissn. Pl. Vasc. Gen. Comm. 100. 1838.
Lithophragma nudicaulis Nutt.; T. & G. Fl. N. Am. 1: 587, as a synonym. 1840.
Mitellopsis trifida Walp. Rep. 2: 370. 1843.

Perennial with a short rootstock; flowering branches 2–3 dm. high, naked, glandular-puberulent; petioles of the basal leaves 5–7 cm. long, retrorse-hairy at least above; blades reniform, 2–4 cm. broad, more or less distinctly 7–9-lobed with broad shallow rounded lobes and crenate, sparingly hairy on both sides; racemes short, 2–6 cm. long; pedicels very short; hypanthium hemispherical, together with the sepals 1.5–2 mm. long; sepals green, triangular-ovate, strongly reflexed; petals cuneate, deeply 3-cleft at the apex; filaments very short.

TYPE LOCALITY: Rocky Mountains, near Smoky River on the east side, in latitude 56°.
DISTRIBUTION: In wet places in the Canadian Rockies.

4. **Ozomelis violacea** Rydb.

Mitella violacea Rydb. Bull. Torrey Club 24: 248. 1897.

Perennial, with a short, thick rootstock; flowering branches 2–3 dm. high, naked, glandular-puberulent; petioles of basal leaves 5–10 cm. long, sparingly retrorse-hirsute; blades broadly cordate in outline, slightly 5–7-lobed with rounded, finely crenate lobes; racemes short with almost sessile flowers; hypanthium campanulate, together with the sepals 3 mm. long and 2 mm. wide; sepals ovate, obtuse, thin, usually veined and tinged with purple or rose; petals oblanceolate, entire or slightly 3-toothed, a little exceeding the sepals.

TYPE LOCALITY: Spanish Basin in the Madison Range, Montana; altitude 1,800 meters.
DISTRIBUTION: Mossy brook-banks of southern Montana.
ILLUSTRATIONS: Bull. Torrey Club, *pl. 305, f. 1* and *2*.

5. **Ozomelis stauropetala** (Piper) Rydb.

Mitella stauropetala Piper, Erythea 7: 161. 1899.

Perennial, with a rather slender rootstock; flowering branches naked, 3–5 dm. high, glandular-puberulent throughout, or slightly hirsute below; petioles 5–10 cm. long, usually distinctly retrorse-hirsute at least above; blades rounded-reniform, indistinctly 5–9-lobed, with round, crenate lobes, sparingly hirsute on both sides; racemes rather elongated, usually secund; pedicels about 1 mm. long; hypanthium turbinate-campanulate, together with the sepals 4–5 mm. long; sepals oblong-ovate, whitish, usually ascending; petals fully twice as long as the sepals, 3-parted half their length into filiform divisions.

TYPE LOCALITY: Craig Mountains, Nez Perces County, Idaho.
DISTRIBUTION: Springy places in woods, Montana to Washington, south to Colorado and Oregon.

6. **Ozomelis stenopetala** (Piper) Rydb.

Mitella trifida S. Wats. Bot. King's Expl. 95. 1871. Not *M. trifida* Graham.
Mitella stenopetala Piper, Erythea **7**: 161. 1899.

Perennial with a short rootstock; flowering branches leafless, 3–5 dm. high, puberulent; petioles of the basal leaves 5–10 cm. long, puberulent, rarely if at all hirsute; blades rounded-reniform, 2–6 cm. wide, ciliate on the margin, indistinctly round-lobed and crenate; racemes secund, often 1 dm. long; flowers scattered, almost sessile; hypanthium campanulate, together with the sepals 2–3 mm. long; sepals whitish, oblong, obtuse; petals about half longer than the sepals, entire, filiform, or ternately cleft above the middle into short filiform divisions.

TYPE LOCALITY: Wahsatch Mountains, north Utah; altitude 1,500 meters.
DISTRIBUTION: Damp places, eastern Utah and Colorado.

7. **Ozomelis Parryi** (Piper) Rydb.

Mitella stenopetala Parryi Piper, Erythea **7**: 162. 1899.

Perennial with a short rootstock; flowering branches leafless, 1.5–3 dm. high, glandular-puberulent above, slightly hairy below; petioles 3–6 cm. long, glandular-puberulent and with a few short hairs; blades 2–3 cm. wide, reniform, sparingly hairy on the veins and the margin, more distinctly lobed than in the next preceding species, deeply crenate; racemes 2–7 cm. long, often secund; flowers nearly sessile; hypanthium with the sepals 1.5–2 mm. long; sepals whitish, rounded-oblong, obtuse; petals about half longer than the sepals, 3-cleft above the middle with filiform divisions.

TYPE LOCALITY: Stinking Water, Wyoming.
DISTRIBUTION: Mountains of Wyoming and Colorado.

8. **Ozomelis micrantha** (Piper) Rydb.

Mitella micrantha Piper, Erythea **7**: 162. 1899.

Perennial with a short rootstock; flowering branches leafless, puberulent above, sparsely pubescent below, 2–4 dm. high; petioles 5–10 cm. long, glabrous or hirsute; blades ovate or round-reniform, 5-lobed, faintly crenate, glabrous or sparsely hirsute on each side and ciliate-margined; racemes 2–10 cm. long, not secund; flowers nearly sessile; hypanthium with sepals 1.5 mm. high; sepals whitish, oblong, obtuse, 3-nerved with simple nerves; petals oblanceolate, entire, acuminate, 3-nerved, exceeding the sepals; stamens short.

TYPE LOCALITY: Fort Colville, Washington.
DISTRIBUTION: Known only from the type locality.

9. **Ozomelis anomala** (Piper) Rydb.

Mitella anomala Piper, Erythea **7**: 162. 1899.

Perennial with a rootstock; flowering branches leafless, 3–4 dm. high, minutely puberulent; petioles 8–10 cm. long, slender, glabrous or retrorsely hairy above; blades rounded-reniform with a broad sinus, 5-veined, scarcely lobed, doubly crenate, sparsely pilose above, glabrous beneath, ciliate, 2–4 cm. broad; raceme 6–12-flowered, not secund; flowers sessile; hypanthium with sepals about 2 mm. high; sepals whitish, acutish, 3-nerved, the midnerve branched; petals wanting; stamens 5, included or replaced by palmately 3–5-cleft staminodia.

TYPE LOCALITY: Mountains near Eureka, California.
DISTRIBUTION: Known only from the type locality.

10. **CONIMITELLA** Rydb. gen. nov.

Perennials with scaly cespitose rootstocks and scapiform lateral flowering branches. Inflorescence racemose. Hypanthium elongated-turbinate, regular, adnate to the larger part of the ovary. Sepals 5, oblong, erect. Petals 5, long-clawed, spatulate, entire, several times longer than the sepals. Stamens 5; filaments very short. Gynoecium mostly in-

ferior, one-celled, with 2 (rarely 3–5) parietal placentae and numerous ovules; stigmas subsessile, capitate. Seeds muricate.

Type species, *Heuchera Williamsii* D. C. Eaton.

1. **Conimitella Williamsii** (D. C. Eaton) Rydb.

Heuchera Williamsii D. C. Eaton, Bot. Gaz. **15**: 61. 1890.
Tellima nudicaulis Greene, Pittonia **2**: 162. 1891.
Lithophragma Williamsii Greene, Erythea **3**: 102. 1895.

Main stem none; flowering branches leafless, 4–6 dm. high, glandular-puberulent; petioles 3–10 cm. long, puberulent; leaf-blades reniform, thick, shining, 3–4 cm. wide, more or less indistinctly round-lobed and crenate with broad teeth, hispid-ciliate on the margin, otherwise glabrous, often tinged with red; raceme short, 3–10 cm. long, 6–12-flowered; hypanthium 3–4 (in fruit 8–10) mm. long, finely puberulent; sepals oblong, 1 mm. long, obtuse, yellowish; petals 5–6 mm. long, narrowly spatulate.

TYPE LOCALITY: Belt Mountains, Montana.
DISTRIBUTION: On hillsides and open places, Montana, Idaho and Wyoming.

11. **ELMERA** Rydb. gen. nov.

Low, glandular-pubescent perennials with a thick scaly rootstock and lateral, leafy flowering branches. Stem-leaves with conspicuous membranous stipules. Inflorescence racemose. Hypanthium deeply campanulate, adnate to the lower half of the gynoecium. Sepals 5, ovate, erect. Petals 5, spatulate, erect, 3–5-cleft at the apex or entire. Stamens 5, opposite to the sepals; filaments very short. Gynoecium 1-celled, half inferior, with 2 parietal many-ovuled placentae; style filiform but short. Capsule opening between the short divergent beaks.

Type species, *Heuchera racemosa* S. Wats.

1. **Elmera racemosa** (S. Wats.) Rydb.

Heuchera racemosa S. Wats. Proc. Am. Acad. **20**: 365. 1885.
Tellima racemosa Greene, Erythea **3**: 55. 1895.

Acaulescent; flowering branches 1–2 dm. high, leafy, hirsute; petioles of basal leaves 2–7 cm. long, glandular-hirsute; blades reniform, crenate and slightly round-lobed, 2–4 cm. broad, pubescent on the veins beneath; leaves of the flowering branches similar with conspicuous stipules; hypanthium campanulate, glandular-puberulent, about 4 mm. long, yellowish-green; sepals rounded-ovate, obtuse; petals greenish-yellow, puberulent, more or less toothed or laciniate, or entire, spatulate in outline, short-clawed, acute, slightly exceeding the sepals.

TYPE LOCALITY: On cliffs of Mount Adams, Washington, at 2,100–2,400 meters altitude.
DISTRIBUTION: Crevices of rocks in the mountains of Washington.

12. **HEUCHERA** L. Sp. Pl. 226. 1753.

Oreanthus Raf. Bull. Bot. Seringe **1**: 216. 1830.
Oreotrys Raf. Atl. Jour. 145. 1832.
Yamala Raf. Fl. Tell. **2**: 75. 1836.
Holochloa Nutt.; T. & G. Fl. N. Am. **1**: 580, as synonym. 1840

Perennials with scaly rootstocks and lateral flowering branches, which are either scapiform or leafy. Inflorescence paniculate. Hypanthium most often campanulate, but sometimes urceolate, cylindrical, turbinate or saucer-shaped, adnate to the lower part of the gynoecium, often more or less oblique. Sepals 5, ovate, oblong or triangular, erect or spreading, often very unequal. Petals obovate, spatulate or oblanceolate, often more or less clawed. Stamens 5, opposite to the sepals, included or exserted, erect; filaments usually filiform. Gynoecium partly inferior, 1-celled, with 2 parietal many-ovuled placentae; styles 2, distinct, elongated. Capsule opening between the two more or less divergent beaks.

Type species, *Heuchera americana* L.

Stamens equaling or exceeding the sepals.
  Hypanthium turbinate, campanulate or urceolate, not very densely pilose.
    Panicle open, not spiciform.
      Hypanthium not strongly oblique.

Hypanthium short-campanulate or turbinate, about as broad as long; stamens at least twice as long as the sepals.
Lobes of the leaf-blades broadly triangular or ovate, acute. I. VILLOSAE.
Lobes of the basal leaf-blades, at least, rounded.
Hypanthium in anthesis turbinate, together with the sepals 2–3 mm. long. II. MICRANTHAE.
Hypanthium in anthesis campanulate, together with the sepals 3–7 mm. long. III. AMERICANAE.
Hypanthium deeply campanulate or urceolate, about twice as long as wide; stamens from equaling to twice as long as the sepals. V. RUBESCENTES.
Hypanthium deeply campanulate, strongly oblique; stamens equaling or slightly exceeding the sepals. IV. HISPIDAE.
Panicle contracted, dense, spiciform. VI. BRACTEATAE.
Hypanthium hemispheric, densely pilose. VII. PILOSISSIMAE.
Stamens much shorter than the sepals.
Hypanthium short-campanulate to saucer-shaped, together with the sepals 3–5 mm. long. VIII. PARVIFOLIAE.
Hypanthium deeply campanulate or urceolate, together with the sepals 5–10 mm. long.
Inflorescence contracted and spiciform; hypanthium green or yellowish. IX. CYLINDRICAE.
Inflorescence open; hypanthium red. X. SANGUINEAE.

I. VILLOSAE

Petioles more or less villous or hirsute.
Leaf-blades broadly reniform; lobes and teeth broadly ovate, mucronate.
Inflorescence narrow; hypanthium campanulate. 1. *H. arkansana.*
Inflorescence open; hypanthium turbinate. 2. *H. crinita.*
Leaf-blades mostly cordate or orbicular-cordate; lobes and teeth triangular.
Petioles densely shaggy-pubescent; middle lobe of the leaf-blades very broad. 3. *H. macrorhiza.*
Petioles sparingly pubescent; middle lobe of the leaf-blades relatively narrow. 4. *H. villosa.*
Petioles glabrous.
Stem scapiform; Atlantic species. 4. *H. villosa.*
Stem leafy; Pacific species. 5. *H. glabra.*

II. MICRANTHAE

Leaves more or less cordate at the base.
Petals oblanceolate, twice as long as the sepals.
Leaf-blades cordate, not broader than long; Pacific species.
Blades of the basal leaves cordate, decidedly longer than broad.
Petioles and lower portion of the stem hirsute.
Stem leafy; inflorescence villous as well as glandular. 6. *H. Hartwegii.*
Stem scapiform; inflorescence merely finely glandular-puberulent. 7. *H. diversifolia.*
Petioles and stems glabrous. 8. *H. glaberrima.*
Blades of the basal leaves rounded-cordate, about as long as broad or slightly longer.
Leaf-blades usually deeply lobed, hairy, especially on the veins and the margins. 9. *H. micrantha.*
Leaf-blades and often also the petioles glabrous; the former with shallow rounded lobes. 10. *H. Nuttallii.*
Leaf-blades broadly reniform, much broader than long; Atlantic species.
Petioles long-hairy. 11. *H. parviflora.*
Petioles finely puberulent. 12. *H. puberula.*
Petals spatulate, about equaling the sepals. 15. *H. calycosa.*
Leaves truncate or cuneate at the base. 46. *H. Pringlei.*

III. AMERICANAE

Petioles and flowering branches more or less long-hirsute.
Petals much exceeding the sepals. 13. *H. Halstedii.*
Petals equaling or shorter than the sepals. 14. *H. hirsuticaulis.*
Petioles and flowering branches glabrous, puberulent, or pubescent with short hairs.
Hypanthium open-campanulate, together with the sepals 4 mm. long or less (only in *H. Curtisii* sometimes up to 6 mm. long).
Flowering branches scapiform.
Petals spatulate or oblong, shorter than or merely equaling the sepals.
Hypanthium with the sepals 2–3 mm. long. 15. *H. calycosa.*
Hypanthium with the sepals 3–4 mm. long.
Leaves dull, pubescent on both sides when young, glabrate above in age. 16. *H. americana.*
Leaves bluish-green, shining, perfectly glabrous, except the ciliolate margins. 17. *H. glauca.*

Petals oblanceolate, about twice as long as the sepals. 18. *H. lancipetala.*
Flowering branches more or less leafy. 19. *H. Curtisii.*
Hypanthium deeply campanulate, together with the sepals 5–7 mm. long. 20. *H. roseola.*

IV. HISPIDAE

Lobes of the leaf-blades triangular-ovate; teeth broadly triangular.
Leaves minutely puberulent on both sides; flowering branches leafy. 21. *H. aceroides.*
Leaves scabrous above, hirsute beneath; flowering branches scapiform. 22. *H. scabra.*
Lobes of the leaf-blades rounded; teeth broadly ovate or rounded.
Flowering branches more or less leafy; petioles glabrous. 23. *H. pubescens.*
Flowering branches scapiform.
Leaf-blades sinuately lobed, crenate with very shallow, broad and mucronate teeth. 24. *H. longiflora.*
Leaf-blades conspicuously lobed; teeth broadly ovate or rounded.
Hypanthium with the sepals over 1 cm. long; petioles usually glabrous, or sparingly short-hairy. 25. *H. Richardsonii.*
Hypanthium with the sepals less than 1 cm. long; petioles long-hispid.
Stamens only slightly exserted.
Teeth of the leaves broadly ovate; hypanthium slightly gibbous below. 26. *H. hispida.*
Teeth of the leaves rounded; hypanthium strongly gibbous below. 27. *H. ciliata.*
Stamens long-exserted, nearly twice as long as the sepals. 14. *H. hirsuticaulis.*

V. RUBESCENTES

Petioles densely hirsute with long brown (at least in age) hairs; leaf-blades with numerous usually sharp teeth; central Mexican species.
Hypanthium cylindric-urceolate, copiously villous; stem and inflorescence villous. 28. *H. longipetala.*
Hypanthium deeply campanulate, sparingly pubescent and glandular; upper portion of the stem and inflorescence glandular-puberulent and sometimes also slightly hairy.
Leaf-blades decidedly hairy.
Leaf-blades 5–7 cm. in diameter; sinus narrow.
Leaf-blades and their lobes rounded; pedicels with stalked glands. 29. *H. orizabensis.*
Leaf-blades and their lobes acute; pedicels with sessile glands. 30. *H. acutifolia.*
Leaf-blades 3–5 cm. in diameter; sinus open. 31. *H. mexicana.*
Leaf-blades almost glabrous, except the margins; sinus open. 32. *H. reglensis.*
Petioles white-hairy, puberulent or glabrous; leaf-blades with few broad teeth; United States species.
Hypanthium almost cylindrical; stamens scarcely exserted.
Hypanthium in fruit urceolate; calyx not very oblique. 33. *H. elegans.*
Hypanthium in fruit open; calyx very oblique. 34. *H. caespitosa.*
Hypanthium deeply campanulate or turbinate.
Leaf-blades more or less cordate at the base; stamens decidedly exserted.
Teeth of the leaves broad, rounded, truncate; petals spatulate. 35. *H. Parishii.*
Teeth of the leaves broadly ovate or triangular, acute and bristle-pointed.
Upper surface of the leaf-blades decidedly hairy.
Leaf-blades reniform or rounded-cordate, with deep basal sinuses; petals narrowly oblanceolate; scapes glandular-puberulent.
Leaf-blades 2–5 cm. wide; petioles 4–15 cm. long; scapes 2–3 dm. high. 31. *H. mexicana.*
Leaf-blades about 1 cm. wide; petioles 0.5–1.5 cm. long; scapes about 1.5 dm. high. 36. *H. pachypoda.*
Leaf-blades ovate-cordate, with shallow sinuses; petals spatulate; scapes densely long-hairy. 37. *H. hirsuta.*
Upper surface of the leaf-blades glabrous or rarely with few hairs when young; scapes glandular-puberulent or glabrous, rarely with a few short hairs.
Sepals as well as the hypanthium dark-red, merely glandular-puberulent; petals spatulate or broadly oblanceolate. 38. *H. Abramsii.*
Sepals with short crisp hairs, pinkish, yellowish or greenish; petals linear-oblanceolate.
Hypanthium deeply turbinate, fully twice as long as broad and nearly twice as long as the sepals. 39. *H. leptomeria.*
Hypanthium campanulate, turbinate only at the base, not more than half longer than broad and scarcely longer than the sepals.
Petioles glabrous or puberulent; inflorescence usually more or less one-sided, and its branches racemiform. 40. *H. rubescens.*
Petioles hirsute; branches of the inflorescence usually cymose.

Hypanthium with the sepals fully 5 mm. long; bractlets lanceolate; inflorescence one-sided.
Petals linear-oblanceolate, about twice as long as the sepals; petioles densely hirsute. 41. *H. Sitgreavesii.*
Petals linear-filiform, slightly if at all exceeding the sepals, or wanting; petioles sparingly hirsute. 42. *H. versicolor.*
Hypanthium with the sepals 3–4 mm. long; bractlets, subulate; inflorescence not one-sided.
Leaves thick, their lobes rounded; teeth broadly rounded-ovate. 43. *H. lithophila.*
Leaves thin, their lobes usually acute; teeth ovate, abruptly acuminate. 44. *H. nana.*
Leaf-blades cuneate or truncate at the base; stamens slightly if at all exserted.
Petioles glabrous; hypanthium deeply campanulate. 45. *H. cuneata.*
Petioles hirsute; hypanthium rounded-campanulate. 46. *H. Pringlei.*

VI. BRACTEATAE

One species. 47. *H. bracteata.*

VII. PILOSISSIMAE

Lobes of the leaves ovate, acute. 48. *H. hemisphaerica.*
Lobes of the leaves rounded, obtuse.
Leaf-blades cordate; stem short, if any.
Panicle contracted, narrow; teeth of the leaves ovate.
Flowering branches 2.5–5 dm. high; leaf-blades cordate at the base. 49. *H. pilosissima.*
Flowering branches 2 dm. high or less; leaf-blades truncate at the base. 50. *H. Merriami.*
Panicle open; teeth of the leaves rounded, mucronate. 51. *H. pilosella.*
Leaf-blades reniform or broadly round-cordate; stem 2–6 dm. high. 52. *H. maxima.*

VIII. PARVIFOLIAE

Petioles more or less hirsute.
Hypanthium with the sepals 2–2.5 mm. long; lobes of the leaves with numerous teeth.
Flowering branches leafy; teeth of the leaves broadly ovate; sepals rounded-oval. 53. *H. minutiflora.*
Flowering branches usually naked; teeth of the leaves triangular; sepals oblong. 54. *H. Lloydii.*
Hypanthium with the sepals 3–4 mm. long; lobes of the leaves with few teeth.
Petals spatulate, almost clawless, not exceeding the sepals. 55. *H. novomexicana.*
Petals obovate-spatulate, distinctly clawed and exceeding the sepals. 56. *H. Wootonii.*
Petioles glabrous.
Hypanthium campanulate, yellowish or pinkish; sepals almost erect.
Leaf-blades deeply lobed; lobes again deeply 3-lobed and toothed; petals narrowly oblanceolate, nearly twice as long as the sepals. 57. *H. gracilis.*
Leaf-blades merely once 5–7-lobed and toothed; petals spatulate, from equaling to half longer than the sepals.
Base of the leaf-blades with an open sinus or almost cuneate; plant 1–3 dm. high. 58. *H. Hallii.*
Base of the leaf-blades with a narrow sinus; plant 3–5 dm. high. 59. *H. grossulariifolia.*
Hypanthium saucer-shaped; sepals spreading.
Hypanthium with the sepals 4 mm. high, yellowish; blades of the petals rhombic. 60. *H. flavescens.*
Hypanthium with the sepals 2–3 mm. high, greenish; petals oblanceolate or spatulate.
Leaf-blades with shallow lobes.
Sinus of the leaf-blades closed, the basal lobes often overlapping; petals not exceeding the sepals. 61. *H. utahensis.*
Sinus of the leaf-blades generally open; petals exceeding the sepals. 62. *H. parvifolia.*
Leaf-blades cleft one half to one third down. 63. *H. flabellifolia.*

IX. CYLINDRICAE

Flowering branches and petioles pubescent.
Flowers greenish; leaf-blades reniform or rounded, deeply cordate at the base; lobes and teeth rounded; petioles long-hairy. 64. *H. cylindrica.*
Flowers yellowish; leaf-blades broadly oval to orbicular, truncate or slightly cordate at the base.
Lobes and teeth of the leaves shallow, rounded.
Leaf-blades thick, densely glandular-pubescent, 1.5–4 cm. wide, rarely cordate at the base. 65. *H. ovalifolia.*
Leaf-blades glabrous, or hairy only on the veins, 3–6 cm. wide, cordate at the base. 66. *H. columbiana.*
Lobes of the leaves deep; teeth broadly ovate. 67. *H. Suksdorfii.*
Flowering branches and petioles glabrous or finely puberulent.

Flowers yellowish; leaf-blades rounded-oval to orbicular, truncate or slightly cordate at the base, only the earliest sometimes reniform. 68. *H. glabella.*
Flowers greenish; leaf-blades thin, reniform or rarely rounded, with deeply cordate base. 69. *H. tenuifolia.*

X. SANGUINEAE

Sepals oblong; teeth of the leaves usually ovate.
Stamens inserted above the middle of the scarlet hypanthium. 70. *H. sanguinea.*
Stamens inserted near the base of the dark-crimson hypanthium. 71. *H. Townsendii.*
Sepals semi-orbicular; teeth of the leaves very broad, rounded or truncate and mucronate. 72. *H. pulchra.*

I. **Villosae**: Plants with short, scaly, ascending rootstocks, and flowering branches from the axils of the leaves of the basal rosette; inflorescence an open, lax panicle with minute flowers; hypanthium almost regular, turbinate or campanulate, together with the sepals 2–3 mm. long; petals spatulate to linear-oblanceolate with filiform claws, one and one half to two times as long as the sepals; filaments filiform, 2–3 times as long as the sepals; carpels ovoid, without the styles 5–6 mm. long; leaf-blades cordate or reniform with triangular or ovate acute lobes.

1. **Heuchera arkansana** Rydb. sp. nov.

Flowering branches scapiform, 1–2 dm. high, slightly if at all exceeding the leaves, more or less glandular white-villous, with a few fringed scales; petioles 4–12 cm. long, glandular white-villous; blades broadly cordate or the earliest reniform, 4–10 cm. in diameter, sparingly pubescent on both sides, with 7–9 broadly ovate lobes, which are toothed and ciliate; teeth broadly ovate, mucronate; inflorescence small and comparatively dense, 4–6 cm. long and about 2 cm. wide; hypanthium campanulate, rounded at the base, sparingly white-hairy, together with the broadly ovate sepals about 2.5 mm. long; petals narrowly oblanceolate, about twice as long as the sepals and equaling the subulate-filiform filaments.

Type collected on shady cliffs, near Springdale, Benton County, Arkansas, by J. W. Blankinship.

DISTRIBUTION: Known only from the type locality.

2. **Heuchera crinita** Rydb.; Britton, Man. 482. 1901.

Flowering branches stout, 5–7 dm. high, either scapiform and bearing a few usually toothed bracts or sometimes 1–3-leaved, villous with brownish hairs; petioles of the basal leaves 2–3 dm. long, brownish-villous; blades 10–22 cm. in diameter, glabrous or slightly hispidulous above, more or less hairy beneath, especially on the veins, broadly reniform in outline, 7–9-lobed; lobes broadly rounded-ovate, toothed and ciliate; teeth also very broadly ovate and mucronate; hypanthium densely glandular-pubescent, together with the ovate sepals in flower about 3 mm. long; petals pinkish, oblanceolate or spatulate, long-clawed, about half longer than the sepals.

TYPE LOCALITY: Kentucky.
DISTRIBUTION: In rocky places, from Kentucky to Illinois and Virginia.

3. **Heuchera macrorhiza** Small, Bull. Torrey Club **25**: 466. 1898.

Flowering branches scapiform, or rarely leafy, 2–5 dm. high, villous-hirsute with brown hairs, naked or with several scale-like bracts; petioles of the basal leaves 1–3 dm. long, densely villous; blades suborbicular with cordate base, 8–20 cm. in diameter, pubescent on both sides, sparingly so above, shallowly 5–9-lobed; lobes very broadly triangular, acute, coarsely toothed and ciliate; hypanthium densely glandular-villous, together with the sepals 2 mm. long in flower, 2.5 mm. in fruit; sepals oblong or ovate-oblong, about as long as the hypanthium; petals linear with filiform claws, fully twice as long as the sepals.

TYPE LOCALITY: Along the Cumberland River at Nashville, Tennessee.
DISTRIBUTION: Bluffs and river-banks, Kentucky and Tennessee.

4. **Heuchera villosa** Michx. Fl. Bor. Am. **1**: 172. 1803.

Heuchera caulescens Pursh, Fl. Am. Sept. 188. 1814.
Heuchera acerifolia Raf. Med. Fl. 1: 241. 1828.
Heuchera squamosa Raf. Med. Fl. 1: 244. 1828.

Flowering branches 2–6 dm. high, scapiform, bearing a few small bracts, villous-hirsute with brown hairs or rarely glabrous; petioles of leaves 1–2 dm. long, more or less vil-

lous-hirsute (very rarely glabrous) as well as the veins of the lower surface of the blades; blades orbicular-cordate, deeply 5–7-lobed, 7–12 cm. wide; lobes triangular, acute, doubly serrate; hypanthium sparingly ciliate and puberulent, together with the oblong-ovate sepals about 2 mm. long; petals pinkish, linear-oblanceolate, long-clawed, fully twice as long as the sepals; filaments about three times as long as the sepals; carpels ovoid, without the styles about 5 mm. long.

TYPE LOCALITY: Higher mountains of North Carolina.
DISTRIBUTION: In rocky places, to an altitude of 1,600 meters, from Virginia and Kentucky to Georgia and Tennessee.
ILLUSTRATIONS: Raf. Med. Fl. **1**: *pl. 49;* Britt. & Brown, Ill. Fl. *f. 1844.*

5. **Heuchera glabra** Willd.; R. & S. Syst. Veg. **6**: 216. 1820.

? *Tiarella colorans* Graham, Edinb. New Phil. Jour. **1829**: 349. 1829.
Heuchera divaricata Fisch.; Seringe, in DC. Prodr. **4**: 51. 1830.

Flowering branches slender, 1–5 dm. high, glabrous, 1–3-leaved or sometimes scapiform; petioles of the basal leaves 6–20 cm. long, glabrous; blades cordate or round-cordate, deeply 5–7-lobed, sparingly hispidulous, and hispid-ciliate when young, soon glabrous, very thin and shining, 3–10 cm. broad and as long or slightly longer; lobes triangular-ovate, acute, doubly and sharply serrate; panicle lax, 0.5–1 dm. long, ovate-oblong in outline, glandular-puberulent; hypanthium turbinate or turbinate-campanulate, sparingly ciliate and puberulent, together with the ovate sepals 2.5–3 mm. long; petals broadly spatulate or ovate with slender claws, acute, about twice as long as the sepals; carpels ovoid, without the styles about 6 mm. long.

TYPE LOCALITY: West coast of North America.
DISTRIBUTION: Damp shady rocks and cliffs, to an altitude of 2,000 meters, from subarctic British America and Alaska to Oregon.
ILLUSTRATIONS: Hook. Fl. Bor. Am. *pl. 79.*

II. **Micranthae**: Plants of the general habit of the preceding group, but the hypanthium more decidedly turbinate and the lobes of the leaves rounded. Two of the western species produce evident but short stems. *H. calycosa* has short-clawed petals, about equaling the sepals, and is therefore placed in the following group.

6. **Heuchera Hartwegii** (S. Wats.) Rydb.

Heuchera pilosissima Benth. Pl. Hartw. 311. 1849. Not *H. pilosissima* F. & M. 1838.
Heuchera micrantha Torr. Bot. Mex. Bound. 69. 1859. Not *H. micrantha* Dougl. 1830.
Heuchera pilosissima Hartwegii S. Wats.; Wheelock, Bull. Torrey Club **17**: 195, as to the type. 1890.

Stem usually produced although short, with the flowering branches in the axils of the leaves; branches leafy, 4–6 dm. high, villous-hirsute with brown hairs; petioles of the basal leaves 1–1.5 dm. long, also villous; blades cordate, 4–8 cm. wide, 5–10 cm. long, hirsute on both sides, often with light blotches, acute at the apex, round-lobed and toothed, with broadly ovate mucronate teeth; lower leaves of the flowering branches cordate and short-petioled, the upper ovate, subsessile and more acutely lobed and toothed; inflorescence 2–3 dm. long, glandular-hirsute; bracts often foliaceous and oblanceolate; hypanthium puberulent, together with the rounded-ovate obtuse sepals about 3 mm. long; petals spatulate, about twice as long as the sepals.

TYPE LOCALITY: In wet places near Monterey, California.
DISTRIBUTION: Ravines of California.
ILLUSTRATION: Parsons, Wild Fl. Calif. 59, as *H. micrantha.*

7. **Heuchera diversifolia** Rydb. sp. nov.

Stem usually somewhat produced but short; flowering branches scapiform, sparingly hirsute, 4–5 dm. high; petioles 1–1.5 dm. long, villous-hirsute with brown hairs; blades variable in shape, those of the earliest cordate, acute, 4–5 cm. wide, 5–6 cm. long, less deeply lobed, with acute lobes and teeth; blades of the later leaves oval, obtuse at the apex, truncate or cordate at the base, more deeply lobed with rounded lobes, sharply dentate, glabrous above, hirsute beneath, especially on the veins; inflorescence glandular-puberulent; bracts linear-subulate; hypanthium finely pubescent and glandular-puberulent, together

with the ovate obtuse sepals about 3 mm. long; petals oblanceolate, white, about twice as long as the sepals.

Type collected on Baldy Peak, Washington, by F. H. Lamb, *no. 1305*.
DISTRIBUTION: Rocky places to an altitude of 800 meters, from British Columbia to northern California.

8. **Heuchera glaberrima** Rydb. sp. nov.

Stem very short if any; flowering branches more or less leafy, 4–6 dm. high, glabrous up to the inflorescence, which is minutely puberulent; petioles of the basal leaves glabrous, 6–12 cm. long, slender; blades cordate, 2–6 cm. long, 1.5–4 cm. wide, glabrous, round-lobed and toothed with broadly ovate, bristle-pointed teeth; blades of the stem-leaves similar, but smaller and comparatively shorter; inflorescence 3–4 dm. long, narrow but open; bracts linear-subulate; hypanthium pubescent, together with the oblong obtuse sepals 2.5 mm. long; petals white, narrowly spatulate, about twice as long as the sepals.

Type collected in Oregon by Howell, and distributed under the name *H. glabra*.

9. **Heuchera micrantha** Dougl. Bot. Reg. *pl. 1302*. 1830.

Heuchera Barbarossa Presl, Rel. Haenk. **2**: 56. 1831.

Flowering branches 1–4-leaved or scapiform, 3–4 dm. high, villous-hirsute with brown hairs, at least below; petioles of basal leaves about 1 dm. long, densely villous-hirsute; blades rounded-cordate, 3–6 cm. long and about as broad, round-lobed and toothed with broadly ovate, cuspidate teeth, sparingly short-pubescent or glabrate above, long-hairy beneath, especially on the veins; inflorescence finely glandular-puberulent; bracts linear or the lower with linear-lanceolate attenuate teeth; hypanthium appressed-pubescent, together with the ovate obtuse sepals 2–2.5 mm. long; petals oblanceolate, whitish.

TYPE LOCALITY: Mountainous woods, near the Grand Rapids of the Columbia.
DISTRIBUTION: From British Columbia to California.
ILLUSTRATION: Bot. Reg. *pl. 1302*.

10. **Heuchera Nuttallii** Rydb. sp. nov.

Heuchera micrantha β T. & G. Fl. N. Am. **1**: 579. 1840.

Flowering branches 3–5 dm. high, glabrous or with a few scattered hairs, few-leaved or scapiform; petioles of basal leaves 5–12 cm. long, glabrous or sparingly hirsute; blades rounded-cordate, about as long as broad, 3–7 cm. long, perfectly glabrous, except the ciliate-tipped teeth; inflorescence glandular-puberulent; bracts linear, the lower sometimes toothed; hypanthium sparingly pubescent, together with the ovate obtuse sepals 2.5–3 mm. long; petals linear-oblanceolate.

Type collected among rocks on the Oregon, near the mouth of the Willamette, by Thomas Nuttall.
DISTRIBUTION: Among rocks and in cañons, Washington and Oregon.

11. **Heuchera parviflora** Bartl. Ind. Sem. Hort. Götting. 1838.—Linnaea **13**: Litt. 96. 1839.

Heuchera Rugelii Shuttl.; Kunze, Linnaea **20**: 43. 1847.

Flowering branches 1.5–6 dm. high, weak, villous-hirsute with glandular white hairs, scapiform; petioles 1–2 dm. long, villous-hirsute; leaf-blades broadly reniform, 5–13 cm. wide, 4–10 cm. long, more or less hairy on both sides especially on the veins on the lower surface, in one form almost velvety, often reddish beneath, with 7–9 broad rounded lobes and very broad mucronate teeth; inflorescence glandular-ciliate; hypanthium together with the sepals 2–2.5 mm. long; petals linear-spatulate, 2–3 times as long as the ovate sepals and almost equaling the stamens.

TYPE LOCALITY: Raised from seed from North Carolina.
DISTRIBUTION: Shaded cliffs, Virginia to Illinois and Missouri, south to Georgia.

12. **Heuchera puberula** Mackenzie & Bush, Rep. Mo. Bot. Gard. **16**: 103. 1905.

Flowering branches 2–3 dm. high, finely glandular-puberulent or almost glabrous, scapiform; petioles about 1 dm. long, finely glandular-puberulent; blades reniform with

an open sinus, sometimes almost truncate at the base, 5–7 cm. wide, 3–6 cm. long, finely puberulent on both sides, with 7–9 broad rounded lobes and broad mucronate teeth; inflorescence loose and rather narrow, minutely puberulent; hypanthium with the sepals 3–3.5 mm. long; petals linear-spatulate, about 3 times as long as the oblong sepals.

TYPE LOCALITY: Monteer, Shannon County, Missouri.
DISTRIBUTION: On bluffs, Missouri.

III. **Americanae**: Plants in habit resembling the preceding group but the hypanthium larger, 3.5–7 mm. long, more campanulate and often oblique, petals usually short-clawed. *H. roseola* and *H. hirsuticaulis* have larger, more oblique hypanthium and thus connect with the *Hispidae*, but they have the elongated filaments of this group.

13. **Heuchera Halstedii** Rydb. sp. nov.

Flowering branches 3–4 dm. high, 2–3-leaved, sparingly brownish-villous; petioles of the basal leaves about 1 dm. long, densely brown-villous; blades about 7 cm. in diameter, almost orbicular in outline, cordate at the base with a very deep and narrow sinus, the basal lobes almost meeting, 7–9-lobed, with rounded lobes and ovate cuspidate teeth, sparingly hirsutulous above and hirsute on the veins beneath; leaves of the flowering branches similar but smaller and with sharper teeth; inflorescence narrow, glandular-puberulent and with scattered hairs; bracts linear-lanceolate, the lower pectinate-toothed; hypanthium puberulent, together with the ovate sepals about 4 mm. long; petals narrowly linear-oblanceolate, much exceeding the sepals; filaments about 3 times as long as the sepals.

Type collected at the foot of basalt cliffs at Hacienda de Regla, 4 leagues west of Real del Monte, Mexico, by Dr. M. B. Halsted.

14. **Heuchera hirsuticaulis** (Wheelock) Rydb.; Britton, Man. 482. 1901.

Heuchera hispida hirsuticaulis Wheelock, Bull. Torrey Club 17: 199. 1890.

Acaulescent; flowering branches scapiform, densely villous-hirsute with white or yellowish hairs, 4–7 dm. long; petioles 5–15 cm. long, also densely hirsute; blades reniform or rounded-cordate, 4–8 cm. in diameter, with 9–11 rounded lobes and broad mucronate teeth, hirsute on both sides or in age glabrate above; inflorescence hirsute and glandular-puberulent; bracts lanceolate, pectinately toothed; hypanthium campanulate, glandular-puberulent, greenish, more or less oblique, together with the oblong very obtuse sepals about 5 mm. long; petals spatulate, green, puberulent, short-clawed and about equaling the sepals; filaments about twice as long.

TYPE LOCALITY: St. Louis, Missouri.
DISTRIBUTION: Rocky banks, Michigan and Illinois to Indiana and Missouri.

15. **Heuchera calycosa** Small, Fl. SE. U. S. 504. 1903.

Flowering branches scapiform, naked, slender, 5–7 dm. high, glabrous or sparingly puberulent; petioles 1–2 dm. long, usually glabrous; leaf-blades rounded-cordate, about as long as broad, 5–10 cm. in diameter, obtuse, with 7–9 rounded lobes and very broad, mucronate teeth, sparingly hairy above, glabrous beneath except the veins; bracts subulate; branches of the inflorescence and hypanthium glandular-puberulent; the latter with the rounded obtuse sepals about 2.5 mm. long; petals spatulate, short-clawed, about equaling the sepals.

TYPE LOCALITY: Mountains of Georgia.
DISTRIBUTION: Mountains of Georgia, North Carolina and Alabama.

16. **Heuchera americana** L. Sp. Pl. 226. 1753.

Heuchera scapigera Moench, Meth. 674. 1794.
Heuchera cortusa Michx. Fl. Bor. Am. 1: 171. 1803.
Heuchera viscida Pursh, Fl. Am. Sept. 187. 1814.

Acaulescent; flowering branches scapiform, pubescent with short hairs or glabrous, 6–9 dm. high, naked; petioles 1–2 dm. high, usually glabrous; leaf-blades rounded-cordate, dull, hirsute beneath especially on the veins, hirsutulous above when young, in age often glabrous, 9–11-lobed with short round lobes and broad mucronate teeth; inflorescence glandular-puberulent; bracts lanceolate to subulate; hypanthium campanulate, glandular-

puberulent, together with the oblong obtuse sepals 3.5–4, seldom only 3 mm. long, usually somewhat oblique; petals spatulate, with very short claws, about equaling the sepals, white, pinkish or greenish; stamens fully 3 times as long as the sepals.

TYPE LOCALITY: Virginia.
DISTRIBUTION: In dry and rocky woods, from Connecticut and Ontario to Minnesota, south to Alabama and Louisiana.
ILLUSTRATIONS: Hill, Veg. Syst. *pl. 43, f. 1;* Schkuhr, Handb. *pl. 58;* Britt. & Brown, Ill. Fl. *f. 1845;* E. & P. Nat. Pfl. 3^{2a}: *f. 29, E–G.*

17. **Heuchera glauca** Raf. Med. Fl. **1**: 244. 1828.

Acaulescent; flowering branches glandular-puberulent or glabrous, 4–6 dm. high, scapiform, naked; petioles 1–2 dm. long, glabrous; leaf-blades rounded-cordate, somewhat more deeply lobed than in *H. americana*, which the plant closely resembles, bluish-green, shining, often purplish beneath, perfectly glabrous, except the ciliate margins; hypanthium with the oblong obtuse sepals about 3 mm. long; petals spatulate, greenish or purple, scarcely equaling the sepals.

TYPE LOCALITY: Cumberland Mountains.
DISTRIBUTION: Rocky bluffs, North Carolina and Tennessee to Georgia and Alabama.

18. **Heuchera lancipetala** Rydb.; Britton, Man. 482. 1901.

Acaulescent; flowering stems stout, about 6 dm. long, sparingly short-hirsute, naked; leaf-blades rounded-cordate or reniform, with round lobes and large broad mucronate teeth, perfectly glabrous, except the ciliate margin and the veins beneath; inflorescence narrower and simpler than in *H. americana;* hypanthium campanulate, but turbinate at the base, more or less oblique, together with the ovate obtuse sepals 4–5 mm. long; petals white or pink, oblanceolate, acute, about half longer than the sepals; stamens about twice as long as the sepals.

TYPE LOCALITY: Kentucky.
DISTRIBUTION: Known only from the type collection.

19. **Heuchera Curtisii** T. & G.; A. Gray, Am. Jour. Sci. **42**: 15. 1841.

Heuchera caulescens β T. & G. Fl. N. Am. 1: 578. 1840.
Heuchera lucida Schlecht. Ind. Sem. Hort. Hal. **1848**: 8. 1848.

Acaulescent; flowering branches 5–10 dm. high, glabrous below, puberulent above, usually with 1–4 leaves; petioles of the basal leaves 1–1.5 dm. long, glabrous or rarely slightly puberulent; blades rounded-cordate or reniform, 3–8 cm. broad, round-lobed and with broad mucronate teeth, glabrous or slightly hispidulous above, ciliate on the margins; leaves of the flowering branches short-petioled or the upper subsessile; blades ovate, acute at the apex, truncate or cordate at the base, with more acute lobes and acute or acuminate teeth; hypanthium glandular-puberulent, together with the oblong, obtuse sepals 4–6 mm. long; petals purple or pink, usually puberulent, spatulate, slightly exceeding the sepals (or shorter than the sepals in the more leafy form described as *H. Curtisii crenata* Rydb.; Britt. Man. 482. 1901).

TYPE LOCALITY: Buncombe County, North Carolina.
DISTRIBUTION: Rich woods, in the mountains from New York to Tennessee and North Carolina.

20. **Heuchera roseola** Rydb.; Britton, Man. 481. 1901.

Acaulescent; flowering branches 5–6 dm. high, glandular-puberulent or glabrous below, 1–3-leaved or sometimes scapiform; petioles of the basal leaves 1–1.5 dm. long, glabrous; blades rounded-cordate, 4–6 cm. wide, 5–7-lobed with rounded lobes, crenate with mucronate teeth, minutely hispid above or soon glabrous, hirsute on the veins beneath and ciliate on the margins; leaves of the flowering branches small, broadly ovate, with sharp acuminate teeth; inflorescence a rather simple panicle, narrow; hypanthium campanulate, decidedly oblique, glandular-puberulent, together with the oblong obtuse sepals 5–7 mm. long; petals light-pink, oblanceolate, about one fourth longer than the sepals.

TYPE LOCALITY: York Furnace, Pennsylvania.
DISTRIBUTION: In woods, Pennsylvania and Virginia.

IV. **Hispidae**: Plants with short, scaly, ascending rootstocks, and flowering branches from the axils of the leaves of the basal rosette; flowering branches stout, sometimes leafy, sometimes scapiform; inflorescence more simple and less open than in the preceding groups; hypanthium deeply campanulate, very oblique and densely glandular-puberulent; stamens equaling or only slightly exceeding the sepals.

21. **Heuchera aceroides** Rydb.; Small, Fl. SE. U. S. 503. 1903.

Acaulescent; flowering branches about 6 dm. high, glabrous or glandular-puberulent above, usually with one or more leaves; petioles of the basal leaves glabrous, 1–1.5 dm. long; blades cordate, about 7-lobed, with triangular acute lobes and broadly triangular mucronate teeth, shining above, puberulent beneath and ciliate on the margin, 5–7 cm. wide and 6–8 cm. long; leaves of the flowering branches ovate, deeply lobed and toothed with lance-ovate teeth, short-petioled; inflorescence glandular-puberulent, with ascending short branches; hypanthium tinged with red, very oblique, together with the sepals 8–10 mm. long; petals pink, spatulate, about equaling the sepals; stamens not exserted.

TYPE LOCALITY: Near Asheville, North Carolina.
DISTRIBUTION: Known only from the type locality.

22. **Heuchera scabra** Rydb. sp. nov.

Acaulescent; flowering branches stout, 6–8 dm. high, glandular-puberulent and usually leafless; petioles 1–2 dm. long, glabrous; leaf-blades cordate, acute, 4–10 cm. wide, thick, scabrous-puberulent above, densely hirsute beneath, rather deeply 7–9-lobed; lobes broadly triangular, doubly serrate with triangular ciliate and mucronate teeth; inflorescence rather narrow; hypanthium deeply campanulate, very gibbous on the lower side, oblique, green, together with the sepals about 1 cm. long; sepals unequal, oblong, obtuse; petals broadly spatulate, equaling or slightly exceeding the sepals; stamens included.

Type collected at Hot Springs, Madison County, mountains of western North Carolina, in 1899, by J. R. Churchill.

23. **Heuchera pubescens** Pursh, Fl. Am. Sept. 187. 1814.

Heuchera pulverulenta Raf. Med. Fl. 1: 243. 1828.
Heuchera reniformis Raf. Med. Fl. 1: 244. 1828.
Heuchera ribifolia Fisch. & Avé-Lall. Ind. Sem. Hort. Petrop. 8: 62. 1841.

Acaulescent; flowering branches stout, 3–9 dm. high, densely glandular-puberulent above, often glabrate below, usually 1–5-leaved; petioles of the basal leaves 1–2 dm. long, glabrous or nearly so; blades rounded-cordate, 7–9-lobed with broadly ovate or sometimes rounded lobes and usually broad mucronate teeth, ciliate on the margin and sparingly hirsutulous when young, glabrate in age; leaves of the flowering branches smaller, cordate or ovate with sharper lobes and teeth; hypanthium deeply campanulate with a turbinate base, very oblique, together with the broadly oblong obtuse sepals 6–8 mm. long; petals broadly spatulate, purplish and puberulent, about equaling or slightly exceeding the sepals; stamens often slightly exserted.

TYPE LOCALITY: On the Blue Mountains of Pennsylvania and Virginia.
DISTRIBUTION: In rich woods, mountains of Pennsylvania to Kentucky and North Carolina.

24. **Heuchera longiflora** Rydb.; Britton, Man. 482. 1901.

Acaulescent; flowering branches scapiform, glabrous or glandular-puberulent above, 4–5 dm. high; petioles glabrous, 5–10 cm. long; leaf-blades rounded-reniform, 5–9 cm. broad, glabrous, except the ciliate margin, with very shallow and rounded lobes and crenate with very broad mucronate teeth; hypanthium deeply campanulate, very oblique, sparingly glandular-puberulent, gibbous on the shorter side, together with the oblong very obtuse sepals 8–10 mm. long; petals spatulate, yellowish, tipped with purple, equaling or slightly exceeding the sepals; stamens included.

TYPE LOCALITY: Hills bordering the Mudlicks, Bath, Kentucky.
DISTRIBUTION: Known only from the type locality.

25. **Heuchera Richardsonii** R. Br. in Frankl. Journey 766. 1823.

Acaulescent; flowering branches 3–4 dm. high, scapiform, sparingly short-hirsute and glandular-puberulent above; petioles glabrous or sparingly pubescent, 5–10 cm. long; leaf-blades rounded-cordate, 3–6 cm. broad, with rounded lobes and broadly ovate mucronate teeth, sparingly hispidulous or in age glabrous, ciliate on the margin; hypanthium deeply campanulate with turbinate base, very oblique, together with the sepals over 1 cm. long; petals spatulate, purplish, slightly exceeding the oblong or slightly spatulate obtuse sepals; stamens not exserted.

TYPE LOCALITY: On the rocky banks of rivers from latitude 54° to 64° north.
DISTRIBUTION: Subarctic America south to Manitoba, Black Hills of South Dakota and British Columbia.
ILLUSTRATION: Frankl. Journey *pl. 29.*

26. **Heuchera hispida** Pursh, Fl. Am. Sept. 188. 1814.

Acaulescent; flowering branches scapiform, usually densely hispid, 6–12 dm. high; petioles also densely white-hispid, 1–2 dm. long; leaf-blades orbicular-cordate or reniform, 4–7 cm. wide, 5–9-lobed with shallow rounded lobes and broad teeth, short-hispidulous or glabrate above, hirsute beneath and ciliate on the margins; hypanthium open-campanulate, very oblique, together with the oblong or somewhat spatulate very obtuse sepals 7–8 mm. long; petals spatulate, equaling or shorter than the sepals; stamens usually slightly exserted.

TYPE LOCALITY: On high mountains of Virginia and Carolina.
DISTRIBUTION: In woods and on hillsides, from Ontario to Assiniboia and Wyoming, south to Virginia and Kansas.

27. **Heuchera ciliata** Rydb. Mem. N. Y. Bot. Gard. **1**: 196. 1900.

Acaulescent; flowering branches about 5 dm. high, ciliate with white hairs and glandular-puberulent above; petioles also ciliate; leaf-blades rounded-reniform, 3–4 cm. in diameter, slightly 5–7-lobed and rounded-crenate, glabrous above, sparingly hairy beneath; hypanthium cylindrical-campanulate, greenish, very oblique and strongly gibbous at the base below, together with the sepals 6–8 mm. long; petals narrowly spatulate with long claws, a little exceeding the oblong sepals, glandular-puberulent; stamens slightly exserted.

TYPE LOCALITY: Mill Creek, Montana.
DISTRIBUTION: In crevices of rocks; known only from the type locality.

V. **Rubescentes:** Usually small plants, less than 4 dm. high, with open but rather few-flowered panicles, deeply campanulate, urceolate or almost cylindrical hypanthium, oblong obtuse sepals, oblanceolate or spatulate, rather long-clawed petals, which are from 1½–2 times as long as the sepals (except in *H. elegans*, where they are broadly spatulate and only slightly exceed the sepals), and exserted stamens, which in most species are twice as long as the sepals. The leaves are characterized by their bristle-tipped teeth.

28. **Heuchera longipetala** Moc.; Seringe in DC. Prodr. **4**: 52. 1830.

Acaulescent; flowering branches scapiform or with 1 or 2 small leaves, 2–4 dm. high, densely villous-hirsute with (at least in age) brown hairs; petioles 5–10 cm. long, also densely hairy, stout; leaf-blades rounded-cordate or reniform with 9–11 rounded lobes and densely serrate with ovate cuspidate bristle-pointed teeth, glabrous above, coarsely hirsute beneath; inflorescence denser than in the related species, hirsute and glandular; hypanthium almost cylindrical, with a turbinate base, densely white-villous, rose-colored, together with the oblong obtuse sepals about 5 mm. long; petals very narrowly linear-oblanceolate, acute, not wider than the filaments and fully equaling them in length, more than twice as long as the sepals.

TYPE LOCALITY: "In Americae bor. plag. occid."[1]
DISTRIBUTION: Shaded cliffs, central Mexico.
ILLUSTRATIONS: Moç. & Sessé, Calques des Dess. Fl. Mex. *423.*

[1] This might indicate that *H. longipetala* should be from our northwest coast, but Moçiño's plants, from which his drawings were made, were from Mexico. Seringe cites Moçiño's unpublished plates. A blue-print copy of the tracings made from these drawings is in the library of the N. Y. Botanical Garden and this agrees better with this Mexican plant than anything else. Hemsley has also come to the same conclusion.

29. **Heuchera orizabensis** Hemsl. Diag. Pl. Nov. 50. 1880.

Acaulescent; flowering branches 3–4 dm. high, scapiform, usually with a few red fimbriate scales and bracts, hirsute with long brownish hairs or the inflorescence merely glandular-puberulent; petioles also densely hirsute, 0.5–1 dm. long; blades orbicular, rounded-cordate or reniform, with deep narrow sinuses at the base, the basal lobes often meeting or nearly so, with shallow round lobes and ovate cuspidate teeth, short-hirsute above, long-hirsute beneath; hypanthium light-rose, campanulate, white-pilose, together with the oblong obtuse greenish-tipped sepals about 4 mm. long; petals narrowly linear-oblanceolate, acute, fully as long as the stamens and over twice as long as the sepals.

TYPE LOCALITY: Mexico, on the peak of Orizaba.
DISTRIBUTION: Cold ledges, central Mexico.

30. **Heuchera acutifolia** Rose, Proc. U. S. Nat. Mus. **29**: 438. 1905.

Perennial with strong, erect or ascending rootstock; flowering branches 3–5 dm. high, green, below slightly hairy, above somewhat glandular-puberulent; blades of the basal leaves 3–6 cm. wide, cordate, somewhat 3–5-lobed, the lobes more or less acute and triangular, when young very pubescent on both sides, sharply toothed, the teeth tipped by long hairs; petioles usually much longer than the blades, sometimes 1 dm. long, densely clothed with long spreading hairs; stipules broad, the free portion obtuse; pedicels bearing sessile glands; hypanthium whitish or rose-colored, together with the sepals 3–4 mm. long; sepals broadly oblong, green at the rounded-obtuse tip; petals white, narrowly linear-oblanceolate, about twice as long as the sepals; stamens and styles long-exserted.

TYPE LOCALITY: Trinidad, on the border of the states of Puebla and Hidalgo.

31. **Heuchera mexicana** Schaffner, sp. nov.

Heuchera rubescens Hemsl.[1] Biol. Cent. Am. Bot. 1: 383. 1880. Not *H. rubescens* Torr. 1852.

Acaulescent; flowering branches scapiform, 3–4 dm. high, sparingly hirsute and glandular-puberulent; petioles 4–10 cm. long, villous-hirsute and glandular with very light-brown hairs; blades rounded-cordate or reniform, 2–4 cm. in diameter, 5–7-lobed, with shallow rounded lobes and ovate mucronate teeth, sparingly short-hirsute and glandular-puberulent on both sides; hypanthium narrowly campanulate, almost cylindrical, together with the oblong sepals 4–5 mm. long, less than 2 mm. wide; petals narrowly oblanceolate, about twice as long as the sepals and equaling the stamens.

Type collected in the mountains near Morelos, San Luis Potosi, Mexico, by Schaffner, *no. 450.*
DISTRIBUTION: Known only from the type locality; there collected also by Parry & Palmer.

32. **Heuchera reglensis** Rydb. sp. nov.

Acaulescent; flowering stems about 3 dm. high, slender, sparingly hirsute with brown hairs, or merely glandular-puberulent above, scapiform with narrow bracts; petioles about 1 dm. long, densely brown villous-hirsute; leaf-blades cordate, 4–7 cm. wide and about as long, rounded-lobed and sharply serrate with ovate, cuspidate teeth, glabrous except the ciliate margins and veins beneath; hypanthium glandular-puberulent and pilose, deeply campanulate, together with the oblong obtuse sepals 4–4.5 mm. long; petals narrowly linear-oblanceolate, as well as the stamens twice as long as the sepals.

Type collected at Regla, Mexico, by Dr. M. B. Halsted.

33. **Heuchera elegans** Abrams, Bull. S. Calif. Acad. **1**: 67. 1902.

Acaulescent and densely cespitose; flowering branches 1–3 dm. high, sparingly hirsute and glandular-puberulent, more or less straw-colored and shining or purplish above; petioles sparingly hirsute, 3–5 cm. long; blades rounded-reniform, 5–7-lobed with rounded, 2–5-toothed lobes, 1.5–3 cm. in diameter, sparingly hirsutulous when young, glabrous in age, ciliate on the margins; teeth rounded-ovate, mucronate and bristle-tipped; hypanthium purple or rose, almost cylindrical or in age urceolate, glandular and white-pilose,

[1] Hemsley, and also Watson, referred it to *H. rubescens*, but it has the brown hairs and the numerous teeth of the leaves found in all the Mexican species of the group. Of these, it comes closest to *H. rubescens*.

together with the oblong sepals 6–8 mm. long; petals broadly spatulate, slightly longer than the sepals; stamens scarcely exserted.

TYPE LOCALITY: Wilson's Peak, Los Angeles County, California.
DISTRIBUTION: Mountains of southern California.

34. **Heuchera caespitosa** Eastw. Proc. Calif. Acad. II. 6: 426. 1896.

Acaulescent, cespitose; flowering branches 1–2 dm. high, glandular-puberulent above; petioles 2–3 cm. long, sparingly puberulent; leaf-blades rounded-cordate, 1–1.5 cm. wide, minutely puberulent above, hirsutulous and glandular-puberulent beneath, 5-lobed; lobes short, rounded-ovate with 3–5 ovate ciliate and bristle-pointed teeth; hypanthium pinkish, glandular-puberulent and white-hairy, cylindro-funnelform, together with the sepals about 6 mm. long; sepals oblong, obtuse, with green tips, the upper much longer; petals spatulate, half longer than the sepals.

TYPE LOCALITY: San Emidia cañon, Kern County, California.
DISTRIBUTION: Known only from the type locality.

35. **Heuchera Parishii** Rydb. sp. nov.

Acaulescent and densely cespitose, with a thick caudex; flowering branches 2–3 dm. high, glandular-puberulent and sparingly hairy, scapiform, usually with a few toothed bracts; petioles 2–4 cm. long, white-hirsute; leaf-blades rounded-reniform, very round-lobed, crenate with broad rounded or even truncate teeth, 2–3 cm. in diameter, ciliate on the margins and sparingly hispidulous on both sides; hypanthium purplish, campanulate, glandular-puberulent, together with the broadly oblong sparingly pilose and obtuse sepals about 5 mm. long; petals pink, oblanceolate, acute, almost twice as long as the sepals, but shorter than the stamens.

Type collected on Mill Creek, San Bernardino Mountains, California, by S. B. Parish, *no. 2512*.

36. **Heuchera pachypoda** Greene, Leaflets 111. 1905.

Acaulescent, with a stout subligneous rootstock; flowering branches about 1.5 dm. high, purplish, glandular-puberulent, scapiform and naked; petioles 0.5–1.5 cm. long, glandular-pubescent and somewhat hirsute; leaf-blades hispidulous on both sides, rounded-reniform, 8–15 mm. wide, rounded 5-lobed, each lobe with 2–4 triangular-ovate teeth; inflorescence more or less one-sided, glandular-puberulent, its branches racemiform; hypanthium glandular-puberulent, campanulate, together with the sepals nearly 5 mm. long; sepals oblong, obtuse, sparingly white-hairy and green-tipped; petals oblanceolate, about twice as long as the sepals and equaling the stamens.

TYPE LOCALITY: Long Pine, Inyo County, California.
DISTRIBUTION: Known only from the type locality.

37. **Heuchera hirsuta** Rydb. sp. nov.

Acaulescent and densely cespitose; flowering branches about 3 dm. high, decidedly hirsute and glandular, scapiform and usually naked; petioles 5–8 cm. long, densely hirsute with long white hairs; blades rounded-cordate or rounded-ovate, with a slightly cordate or almost truncate base, densely white-hairy on both sides, 5–7-lobed with rounded-ovate, few-toothed lobes; inflorescence more or less one-sided, hirsute and glandular; hypanthium greenish-brown, glandular-puberulent, together with the oblong, obtuse, yellow or slightly pinkish and green-tipped sepals about 6 mm. long; petals spatulate, about half longer than the sepals and almost equaling the stamens.

Type collected at Snow Cañon, southern California, at 1,800 meters, by S. B. Parish, *no. 5062*.

38. **Heuchera Abramsii** Rydb. sp. nov.

Acaulescent and densely cespitose; flowering branches scapiform, naked, sparingly glandular-puberulent, 0.5–1.5 dm. high; petioles 1–2 cm. long, puberulent; leaf-blades reniform, 1–1.5 cm. broad, glandular-puberulent, round-lobed and with broadly ovate teeth; branches of the inflorescence very short; hypanthium deeply campanulate, dark-purplish,

together with the oblong obtuse glandular-puberulent sepals 4 mm. long; petals white, spatulate or broadly oblanceolate, half longer than the sepals.

Type collected on Mt. San Antonio, San Bernardino County, California, by L. R. Abrams, *no. 1924*.

39. **Heuchera leptomeria** Greene, Leaflets 112. 1905.

Acaulescent with a stout rootstock; flowering branches about 3 dm. high, finely glandular-puberulent or glabrous, naked; petioles 4–6 cm. long, glandular-puberulent and sparingly hirsute; leaf-blades reniform-orbicular or rounded-cordate, 2.5–5 cm. wide, rounded 5–7-lobed and with broadly ovate mucronate teeth, glabrous above, sparingly hirsute on the veins beneath and along the margins; inflorescence open, scarcely secund, glandular-puberulent, its branches often racemiform; bracts and bractlets lanceolate; hypanthium glandular-puberulent, narrowly turbinate, together with the sepals 4–5 mm. long; sepals oblong, obtuse, purplish, sparingly white-hairy; sepals narrowly linear-oblanceolate, long-clawed, twice as long as the sepals and equaling the stamens.

TYPE LOCALITY: Organ Mountains, New Mexico.
DISTRIBUTION: Known only from the Organ Mountains.

40. **Heuchera rubescens** Torr. in Stansb. Expl. Utah 388. 1852.

Acaulescent; flowering branches scapiform, naked, 2–4 dm. high, straw-colored, shining, glabrous or slightly glandular-puberulent; petioles 3–6 cm. long, glabrous or glandular-puberulent; leaf-blades reniform or rounded-cordate, 2–4 cm. in diameter, perfectly glabrous or minutely glandular-puberulent, or rarely with a few hairs on the veins, thick, shining, rounded 5-lobed and with rounded, ovate, bristle-pointed teeth; hypanthium campanulate, pinkish, glandular-puberulent, together with the oblong, obtuse, pilose, green-tipped sepals about 5 mm. long; petals linear-oblanceolate, acute, almost twice as long as the sepals and nearly equaling the stamens.

TYPE LOCALITY: Summit of mountains on Stansbury's Island, Utah.
DISTRIBUTION: Mountains, Utah and New Mexico to Oregon and eastern California.
ILLUSTRATION: Stansb. Expl. Utah *pl. 5*.

41. **Heuchera Sitgreavesii** Rydb. sp. nov.

Heuchera rubescens Torr. in Sitgreaves, Rep. Exp. 160. 1853. Not *H. rubescens* Torr. 1852.

Acaulescent; flowering branches 3–4 dm. high, glandular-puberulent and more or less hirsute, sometimes with 1 or 2 small leaves; petioles about 5 cm. long, densely hirsute; blades rounded-cordate, 3–5 cm. broad, glabrous above, hirsute on the veins beneath, slightly lobed and with broadly ovate, ciliate and bristle-pointed teeth; inflorescence more or less one-sided, its branches usually cymose; bractlets lanceolate; hypanthium glandular-puberulent, together with the sepals fully 5 mm. long; sepals oblong, more or less white-hairy; petals linear-oblanceolate.

Type collected near Camp 19, New Mexico, 1851, by S. W. Woodhouse in Sitgreaves's Expedition.

42. **Heuchera versicolor** Greene, Leaflets 112. 1905.

Acaulescent with a stout rootstock; flowering branches naked, 1.5–2 dm. high, glabrous or minutely puberulent; petioles glandular-puberulent and sparingly hirsute, 4–8 cm. long; leaf-blades rounded-cordate, 3–5 cm. wide, thin, shining, glabrous above, sparingly hirsute on the veins beneath and on the margins, 5–9-lobed and with broadly ovate teeth; inflorescence decidedly unilateral with racemiform branches; bracts lanceolate, purple, entire or 3-fid; hypanthium campanulate with turbinate base, glandular-puberulent, rose or purplish, together with the sepals about 5 mm. long; sepals oblong, obtuse, pinkish and green-tipped, changing into rose-red; petals linear-filiform, little if at all surpassing the sepals, or often wanting; stamens often more than twice as long as the sepals.

TYPE LOCALITY: Damp shady bluffs, Black Range, New Mexico.
DISTRIBUTION: Known only from the type locality.

43. **Heuchera lithophila** Heller, Muhlenbergia **1**: 105. 1904.

Acaulescent; flowering branches scapiform, 2–3 dm. high, more or less ciliate below or glabrous; petioles 3–7 cm. long, hirsute-ciliate; leaf-blades broadly ovate to reniform, truncate or cordate at base, glabrous or slightly puberulent above, more or less hirsute on the veins beneath, 2–6 cm. in diameter, round-lobed and with rounded-ovate, ciliate and bristle-pointed teeth; hypanthium deeply campanulate, pinkish, glandular-puberulent and more or less white-hairy, together with sepals 3.5–4 mm. long; sepals lance-oblong, obtuse, with greenish tips; petals narrowly linear-oblanceolate, fully twice as long as the sepals.

TYPE LOCALITY: Donner Pass, Nevada County, California.
DISTRIBUTION: Sierra Nevada and Cuyamaca mountains of California.

44. **Heuchera nana** (A. Gray) Rydb.

Heuchera rubescens nana A. Gray, Pl. Wright. **2**: 64. 1853.

Acaulescent; flowering branches rarely with 1 or 2 small leaves, glabrous and shining, 3–4 dm. high, or in the typical depauperate alpine form 1–2 dm. high; petioles 3–8 cm. long, sparingly white-hirsute; leaf-blades cordate, usually more or less lobed, shining glabrous except the ciliate margins and veins; lobes, if any, triangular-ovate, acute; teeth ovate, abruptly acuminate and bristle-tipped; inflorescence not secund, open or in the alpine form contracted; hypanthium glandular-puberulent, campanulate-turbinate, together with the oblong obtuse slightly pilose sepals about 3.5 mm. long; petals narrowly linear-oblanceolate, as well as the stamens nearly twice as long as the sepals.

TYPE LOCALITY: Crevices on rocks, mountains near the copper mines, New Mexico.
DISTRIBUTION: Mountains of New Mexico, Arizona, and northern Mexico.

45. **Heuchera cuneata** Howell, Fl. NW. Am. 203. 1898.

Heuchera rubescens oregonensis Wheelock, Bull. Torrey Club **17**: 197. 1890.

Acaulescent and densely cespitose; flowering branches scapiform, naked, slender, glabrous or minutely glandular-puberulent; petioles 2–6 cm. long, also minutely glandular-puberulent; blades almost orbicular in outline, 1.5–2.5 cm. broad, thin, minutely glandular-puberulent and ciliate on the margins, rounded 5-lobed and with broadly ovate teeth, cuneate or truncate at the base; hypanthium campanulate with turbinate base, glandular-puberulent, pinkish, together with the oblong obtuse sepals 4–5 mm. long; petals narrowly oblanceolate, about half longer than the sepals and fully equaling the stamens.

TYPE LOCALITY: Harney Valley, eastern Oregon.
DISTRIBUTION: Mountains of Oregon.

46. **Heuchera Pringlei** Rydb. sp. nov.

Acaulescent and cespitose; flowering branches 2–3 dm. high, glandular-puberulent and somewhat hirsute below; petioles 2–4 cm. long, more or less hirsute; blades orbicular or rounded-ovate, truncate or cuneate at the base, 2–3.5 cm. wide, glandular-puberulent and somewhat hirsutulous on the veins, slightly lobed and with broadly ovate, bristle-tipped teeth; inflorescence rather dense; hypanthium rounded-campanulate, glandular-puberulent and somewhat crisp-hairy, together with the sepals 3–4 mm. long; sepals rounded-oval; petals linear-oblanceolate, about twice as long as the sepals; stamens of the same length.

Type collected at Castle Lake, Siskiyou County, California, in 1881, by C. G. Pringle.
DISTRIBUTION: Type locality and in the Yosemite Valley.

VI. **Bracteatae**: Plants resembling the preceding group, but the inflorescence dense and spiciform, and the petals and stamens only slightly exceeding the sepals.

47. **Heuchera bracteata** (Torr.) Seringe in DC. Prodr. **4**: 52. 1830.

Tiarella trifoliata James, Trans. Am. Phil. Soc. II. **2**: 181. 1825. Not *T. trifoliata* L. 1753.
Tiarella (?) *bracteata* Torr. Ann. Lyc. N. Y. **2**: 204. 1827.
Oreotrys bracteata Raf. Atl. Jour. 145. 1832.

Acaulescent and densely cespitose; flowering branches usually about 1 dm., seldom 3 dm. high, glandular-puberulent or glabrate, usually with a few minute leaves; petioles of

basal leaves 2–5 cm. long, glandular-puberulent; blades rounded-reniform, 1–3 cm. in diameter, more or less round-lobed, and with ovate cuspidate-tipped teeth, glandular-puberulent and minutely ciliate on the margins; inflorescence dense and spike-like; hypanthium deeply campanulate, glandular-puberulent, together with the oblong obtuse sepals 3–4 mm. long; petals oblanceolate or spatulate, slightly exceeding the sepals; stamens scarcely one-half longer than the sepals.

TYPE LOCALITY: Rocky Mountains, Colorado.
DISTRIBUTION: High alpine regions of Colorado and southern Wyoming.

VII. **Pilosissimae**: Acaulescent or often with more or less evident stems, with cordate round-lobed leaf-blades, hirsute petioles and flowering branches, hemispherical densely hirsute-pilose hypanthium, very short round sepals, short oblanceolate petals slightly exceeding the sepals, rather short but exserted stamens, and very short styles and carpels.

48. **Heuchera hemisphaerica** Rydb. sp. nov.

Acaulescent; the flowering branches scapiform, 2–3 dm. high, sparingly hirsute with brown hairs and bearing few brown scales; petioles 3–8 cm. long, brown-hirsute; leaf-blades cordate, 3–5 cm. wide, hirsute on both sides, rather deeply 3–5-lobed; lobes ovate, acute, often again lobed and few-toothed; teeth ovate and bristle-tipped; inflorescence rather small and loose, glandular-puberulent; hypanthium hemispherical, densely pilose with red hairs, but in age almost glabrous, together with the short rounded-ovate obtuse sepals about 3 mm. long; filaments subulate, about twice as long as the sepals; petals small, oblanceolate, about equaling the sepals.

Type collected in the Santa Lucia Mountains, California, in 1886, by T. S. Brandegee (Gray Herbarium).
DISTRIBUTION: Santa Lucia Mountains, California.

49. **Heuchera pilosissima** F. & M. Ind. Sem. Hort. Petrop. **5**: 36. 1838.

Heuchera hispida H. & A. Bot. Beech. Voy. 347. 1838. Not *H. hispida* Pursh.
Heuchera hirtiflora T. & G. Fl. N. Am. **1**: 582. 1840.

Acaulescent or often short-stemmed; flowering branches usually more or less leafy, 2.5–5 dm. high, densely villous-hirsute with brown hairs; petioles of basal leaves about 1 dm. long, also densely hirsute; blades thick, cordate, obtuse, with rounded lobes and double-toothed with ovate teeth, hirsute on both sides; leaves of the flowering branches similar, but small and short-petioled; inflorescence dense and narrow; hypanthium hemispherical, densely hirsute, together with the rounded sepals about 4 mm. long; petals spatulate, longer than the sepals; stamens exserted.

TYPE LOCALITY: New California near the Russian settlement.
DISTRIBUTION: In the coast-range of California.

50. **Heuchera Merriami** Eastw. Bull. Torrey Club **32**: 199. 1905.

Acaulescent with a thick horizontal rootstock; flowering branches several from the base, 2 dm. high or less, usually with a small leaf near the base; basal petioles 1–4 cm. long, glandular-hirsute; leaf-blades orbicular to ovate, truncate at the base, slightly lobed and crenate, 2–3 cm. wide, glandular and hispid especially beneath; panicle contracted, glandular-puberulent; hypanthium hemispheric, together with the sepals 3–4 mm. long; sepals rounded; petals white, oblanceolate, obtuse; seeds brown, echinate.

TYPE LOCALITY: Canyon Creek, Trinity County, California.
DISTRIBUTION: Type locality and vicinity.

51. **Heuchera pilosella** Rydb. sp. nov.

Heuchera pilosissima Hartwegii S. Wats.; Wheelock, Bull. Torrey Club **17**: 195, in part. 1890.

Acaulescent or short-stemmed; flowering branches sparingly hirsute and glandular-puberulent, with a few small leaves, or scapiform; petioles of basal leaves 1–1.5 dm. long, more densely hirsute with brownish hairs; blades cordate, obtuse, 3–6 cm. wide and 4–6 cm. long, thin, sparingly hirsutulous above, hirsute beneath especially on the veins, rounded 5–7-lobed and rounded- or ovate-crenate; leaves of the flowering branches smaller

and with sharper teeth; inflorescence open, glandular-pubescent; hypanthium hemispherical, densely hirsute-pilose, together with the rounded sepals 3–4 mm. long; petals oblanceolate, scarcely longer than the sepals; stamens somewhat exserted.

Type collected at San Luis Obispo, California, by E. Palmer, *no. 124*.
DISTRIBUTION: In the coast range of south-central California.

52. **Heuchera maxima** Greene, Bull. Calif. Acad. **2**: 149. 1886.

Plant with elongated, adsurgent or ascending stems, 2–6 dm. high; flowering branches about 3 dm. high, densely glandular-hirsute, naked; petioles 1.5–2 dm. long, also densely hirsute; blades rounded-cordate or orbicular with a cordate base and a deep narrow sinus, 7–15 cm. in diameter, with 7–9 rounded lobes and broadly ovate, cuspidate and ciliate teeth, glabrous above, hirsute on the veins beneath; inflorescence contracted, densely glandular-puberulent; hypanthium densely glandular-puberulent, together with the rounded-ovate obtuse sepals about 4 mm. long; petals minute, white.

TYPE LOCALITY: Rocky steeps near the sea, on the northward slope of Santa Cruz Island, California.
DISTRIBUTION: Type locality only station known.

VIII. **Parvifoliae**: Small acaulescent and cespitose plants with scapiform flowering branches and narrow spike-like panicles of greenish or yellowish flowers, short-turbinate or campanulate hypanthium, short included and incurved stamens, short-clawed or subsessile petals, only slightly if at all exceeding the sepals, and small reniform or rounded-cordate, round-lobed leaf-blades.

53. **Heuchera minutiflora** Hemsl. Diag. Pl. Nov. 50. 1880.

Acaulescent; flowering branches 3–5 dm. high, more or less glandular-hairy, more or less leafy; petioles of basal leaves 4–6 cm. long, hirsute; blades nearly orbicular with cordate base, 4–6 cm. wide, glabrate or nearly so, indistinctly 9–11-lobed, with broadly ovate mucronate teeth; inflorescence narrow; hypanthium with the sepals 2 mm. long, glandular-puberulent; sepals rounded-oblong; petals oblanceolate, slightly exceeding the sepals; filaments very short, not exceeding the ovate anthers.

TYPE LOCALITY: Mexico, on the mountain Popocatepetl.
DISTRIBUTION: Known only from the type locality.

54. **Heuchera Lloydii** Rydb. sp. nov.

Acaulescent; flowering branches scapiform and usually leafless, 2–3 dm. high, glabrous or slightly glandular-hirsute; petioles 5–7 cm. long, sparingly glandular-hirsute; blades rounded-cordate, 3–5 cm. broad, glabrous or slightly ciliate on the margins and the veins, round-lobed and with numerous ovate, cuspidate teeth; inflorescence open; hypanthium campanulate, puberulent, together with the oblong sepals 2–2.5 mm. long; petals linear-oblanceolate.

Type collected on the forty-fifth parallel in the Cascade Mountains, in 1895, by F. E. Lloyd.
DISTRIBUTION: In the Cascade Mountains of Oregon and Washington.

55. **Heuchera novomexicana** Wheelock, Bull. Torrey Club **17**: 200. 1890.

Acaulescent; flowering branches scapiform, naked, glandular-puberulent or slightly hirsute below, 3–5 dm. high, slender; petioles 4–12 cm. long, more or less hirsute; leaf-blades reniform or rounded-cordate, with 7–9 rounded lobes and broadly ovate, mucronate teeth, glabrous above, more or less hairy on the veins beneath and ciliate on the margins, 2–6 cm. in diameter; inflorescence long and narrow, glandular-puberulent; hypanthium turbinate-campanulate, glandular-puberulent, short-pedicelled, yellowish, together with the rounded-ovate ascending sepals 3–4 mm. long; petals spatulate, almost clawless, barely equaling the sepals.

TYPE LOCALITY: New Mexico.
DISTRIBUTION: Mountains of New Mexico and Arizona.

56. **Heuchera Wootonii** Rydb. sp. nov.

Acaulescent; flowering branches about 6 dm. high, sparingly hirsute, scapiform; petioles 1–1.5 dm. long, sparingly hirsute; leaf-blades rounded-cordate, 4–7 cm. wide, glabrous

above, sparingly hirsute beneath, ciliate on the margins; lobes rounded-ovate, double-toothed; teeth ovate, mucronate; inflorescence rather narrow; hypanthium yellowish-green, glandular-puberulent, turbinate, together with the triangular sepals 2–3 mm. long; petals whitish, clawed, about twice as long as the sepals, with almost orbicular blade.

Type collected in the White Mountains, Lincoln County, New Mexico, in 1897, by E. O. Wooton.

57. **Heuchera gracilis** Rydb. sp. nov.

Acaulescent; flowering branches scapiform, very slender, about 4 dm. high, finely glandular-puberulent; petioles 5–10 cm. long, almost glabrous; leaf-blades rounded-reniform, very thin, glabrous, about 3 cm. broad, deeply 5–7-lobed; lobes again 3-lobed and with broadly ovate bristle-pointed teeth; panicle very short and narrow; hypanthium yellowish, campanulate, finely glandular-puberulent, together with the erect oblong obtuse sepals about 4 mm. long; petals narrowly linear-oblanceolate, with slender claw, nearly twice as long as the sepals.

Type collected on Mt. Idaho, Camas Prairie, Idaho, by L. F. Henderson, *no. 3159* (U. S. Nat. Herb.).

58. **Heuchera Hallii** A. Gray, Proc. Acad. Phila. **1863**: 62. 1864.

Acaulescent and densely cespitose with a thick caudex; flowering stems scapiform, naked, glabrous or minutely puberulent, 1–3 dm. high; petioles 2–8 cm. long, minutely puberulent or glabrous; leaf-blades rounded-reniform, with an open sinus, deeply 5–7-lobed and with ovate, bristle-tipped teeth, 1–3.5 cm. wide, thick and shining, glabrous or minutely glandular-puberulent; inflorescence narrow, short, 2–6 cm. long; hypanthium yellowish or pinkish, campanulate, together with the rounded-ovate sepals 4–5 mm. long; petals spatulate, clawed, one half longer than the sepals.

TYPE LOCALITY: Rocks on mountains of medium elevation (Colorado).
DISTRIBUTION: Alpine and subalpine regions of Colorado.

59. **Heuchera grossulariifolia** Rydb. Mem. N. Y. Bot. Gard. 1: 196. 1900.

Acaulescent and cespitose, closely allied to the preceding; flowering branches 3–5 dm. high, scapiform, naked, glabrous or sparingly glandular-puberulent, as are the petioles; leaf-blades rounded-cordate or reniform, with a deep sinus at the base, thin, glabrous or minutely glandular-puberulent, 5–7-lobed, with rounded lobes and round-ovate bristle-tipped teeth; inflorescence very short and narrow, 2–4 cm. long; hypanthium yellow, glandular-puberulent, campanulate, together with the ovate sepals 4 mm. long; petals spatulate, scarcely exceeding the sepals.

TYPE LOCALITY: Pony, Montana.
DISTRIBUTION: Rocky hillsides, Montana, Idaho and Oregon.

60. **Heuchera flavescens** Rydb. sp. nov.

Acaulescent; flowering branches scapiform, naked, glandular-puberulent, 4–6 dm. high; petioles about 1 dm. long, glabrous, glandular-puberulent or with scattered hairs; blades reniform or rounded-cordate, thin, glabrous, except the ciliate margins, and sometimes the veins beneath, round-lobed and with very broadly ovate mucronate teeth, 3–6 cm. wide; inflorescence elongated; hypanthium yellowish, glandular-puberulent, turbinate-campanulate, together with the triangular ovate spreading sepals 4 mm. long; petals exceeding the sepals, with narrow claws, the blades rhombic, almost as broad as long, pinkish.

Type collected in the Santa Fé Cañon, 9 miles east of Santa Fé, by A. A. and E. Gertrude Heller, *no. 3693*.
DISTRIBUTION: Rocky hills and mountains of New Mexico, Arizona and Utah.

61. **Heuchera utahensis** Rydb. sp. nov.

Heuchera parvifolia S. Wats. Bot. King's Expl. 96, in part. 1871.

Acaulescent; flowering branches 5–6 dm. high, minutely puberulent; petioles 6–10 cm. long, glabrous or nearly so; blades reniform, the basal lobes usually overlapping, 5–8 cm. broad, almost glabrous and shining, crenate with rounded or truncate teeth; inflorescence

narrow, but open; hypanthium greenish, together with the triangular sepals about 3 mm. long; petals spatulate, scarcely equaling the sepals.

Type collected in City Creek Cañon, Utah, at an altitude of 2,200 meters, in 1880, by M. E. Jones, *no. 9458*.

DISTRIBUTION: Hills and cañons of Utah.

62. **Heuchera parvifolia** Nutt.; T. & G. Fl. N. Am. **1**: 581. 1840.

Acaulescent and cespitose; flowering branches scapiform, naked, glandular-pubescent, 1–4 dm. high; petioles 3–10 cm. long, glandular-puberulent or glabrous; blades reniform, usually with an open sinus, with 7–9 shallow, rounded lobes, and crenate with round teeth, glandular-puberulent or glabrous; inflorescence first short, but soon elongated; hypanthium green, openly turbinate, glandular-puberulent, together with the broadly ovate sepals 2–3 mm. high; petals yellowish, spatulate, with a broad, short claw, usually somewhat exceeding the sepals.

TYPE LOCALITY: Blue Mountains of Oregon.

DISTRIBUTION: Hills from Alberta and eastern Oregon to New Mexico and Arizona.

63. **Heuchera flabellifolia** Rydb. sp. nov.

Acaulescent and cespitose, closely related to the preceding; flowering branches slender, 2–3 dm. high, glandular-puberulent, subscapose; petioles also puberulent or glabrous; leaf-blades 1.5–3 cm. broad, rounded-reniform, cleft ⅓–½ to the base into 7–9 somewhat cuneate lobes, which are rounded-crenate at the apex, glabrous or minutely glandular-puberulent, and ciliate on the margin; the sinuses between the lobes of the leaves very narrow and rounded at the bottom, and the lobes often overlapping; flowers usually smaller; hypanthium about 2 mm. high; otherwise as in *H. parvifolia*.

Type collected in the Bridger Mountains, Gallatin County, Montana, in 1897, by Rydberg & Bessey, *no. 4292*.

DISTRIBUTION: Hills and mountain-sides, Alberta, Montana and Northern Wyoming.

IX. **Cylindricae**: Coarse species with dense spike-like panicles and greenish or yellowish flowers, deeply campanulate or almost cylindrical hypanthium which is together with the oblong sepals 6–8 mm. long, included short stamens, small oblanceolate petals which are not over half as long as the sepals, or petals often lacking, included pistils and fruit, and coarse round-lobed and toothed leaves.

64. **Heuchera cylindrica** Dougl.; Hook. Fl. Bor. Am. **1**: 236. 1832.

Yamala cylindrica Raf. Fl. Tell. **2**: 75. 1836.
Holochloa elata Nutt. T. & G. Fl. N. Am. **1**: 580, as a synonym. 1840.
Holochloa cylindrica Nutt. *loc. cit.*

Acaulescent; flowering branches scapiform, naked or with minute bracts, villous with long (in age brown) hairs, 5–7 dm. high; petioles 1–2 dm. long, also villous; blades reniform or rounded-cordate, 5–8 cm. wide, round-lobed and with ovate cuspidate teeth; inflorescence 0.5–1 dm. long, dense; hypanthium greenish, deeply campanulate, oblique, hirsute and glandular, together with the oblong sepals 7–8 mm. or in fruit over 1 cm. long; petals minute or usually lacking.

TYPE LOCALITY: On the declivities of low hills and on the steep banks of streams on the west side of the Rocky Mountains.

DISTRIBUTION: Low ground and river banks, British Columbia to Oregon and Idaho.

ILLUSTRATIONS: Bot. Reg. **23**: *pl. 1924*; E. & P. Nat. Pfl. **3**[2a]: *f. 29, H–L*.

65. **Heuchera ovalifolia** Nutt.; T. & G. Fl. N. Am. **1**: 581. 1840.

Heuchera cylindrica alpina[1] S. Wats. Bot. King's Expl. 94. 1871.
Heuchera cylindrica ovalifolia Wheelock, Bull. Torrey Club **17**: 203. 1890.
Heuchera saxicola E. Nelson, Bot. Gaz. **30**: 118. 1900.
Heuchera alpina Blankinship, Mont. Agr. Coll. Sci. Stud. **1**: 62. 1905.

Acaulescent; flowering branches scapiform, naked, densely glandular-pubescent with short hairs, as well as the petioles, which are 5–10 cm. long; leaf-blades rounded-oval, 1.5–4 cm. broad and 2–5 cm. long, truncate, rounded, or slightly cordate at the base, round-

[1] An alpine form almost matching the original *H. ovalifolia*.

lobed, and crenate with rounded mucronate teeth; inflorescence short and dense, less than 1 dm. long; hypanthium deeply campanulate, yellowish, densely short-hirsute, together with the broadly oblong sepals about 7 mm. long; petals usually wanting.

TYPE LOCALITY: Blue Mountains, Oregon.
DISTRIBUTION: Rocky banks and hillsides, Alberta and British Columbia to Wyoming, Nevada and Oregon.

66. **Heuchera columbiana** Rydb. sp. nov.

Acaulescent; flowering branches scapiform, naked, hirsute with white hairs, about 5 dm. high; petioles 5–10 cm. long, hirsute; leaf-blades orbicular or nearly so, deeply cordate at the base, glabrous or ciliate on the margins and veins, thin and shining, 3–6 cm. broad, round-lobed and crenate; inflorescence elongated, spike-like, 5–8 cm. long; hypanthium deeply campanulate, yellowish, densely short-hirsute, together with the oblong, obtuse or acute sepals 6–9 mm. long; petals apparently wanting.

Type collected near Swan Lake, Washington, in 1897, by J. B. Winston.
DISTRIBUTION: Interior of Washington, Idaho and Montana.

67. **Heuchera Suksdorfii** Rydb. sp. nov.

Acaulescent, related to *H. ovalifolia* and *H. glabella;* flowering branches 2–3 dm. high, glandular-pubescent with short hairs, scapiform, with usually 1 or 2 scales; leaf-blades also pubescent, 5 cm. long or less; blades thick, dark-green, about 2 cm. wide, finely glandular-pubescent, deeply 5–7-lobed; teeth broadly ovate, bristle-pointed; inflorescence short, 2–4 cm. long, dense; hypanthium yellowish, glandular-puberulent, together with the oblong sepals about 8 mm. long; petals minute, oblanceolate or none.

Type collected in crevices of rocks, Falcon Valley, June 28, 1882, by W. N. Suksdorf (Columbia University Herbarium).
DISTRIBUTION: In the Cascade Mountains of Washington and Oregon.

68. **Heuchera glabella** T. & G. Fl. N. Am. **1**: 581. 1840.

Holochloa glabra Nutt.; T. & G. *loc. cit.* as synonym.
Heuchera cylindrica glabella Wheelock, Bull. Torrey Club **17**: 203. 1890.

Acaulescent; flowering branches scapiform, 4–6 dm. high, glandular-puberulent or glabrous; petioles 5–10 cm. long, glandular-puberulent or glabrous; leaf-blades rounded-oval or orbicular, slightly cordate or truncate at the base, 2–5 cm. wide, 2–6 cm. long, glabrous or minutely glandular-puberulent, with ciliate margins, round-lobed and with rounded, ovate, mucronate teeth; inflorescence narrow, elongated; hypanthium deeply campanulate, together with the broadly oblong sepals about 7 mm. long; petals usually lacking.

TYPE LOCALITY: Rocky Mountains towards the Oregon.
DISTRIBUTION: Rocky hills, Alberta and Washington to Montana and Oregon.

69. **Heuchera tenuifolia** (Wheelock) Rydb.

Heuchera cylindrica tenuifolia Wheelock, Bull. Torrey Club **17**: 204. 1890.

Acaulescent; flowering branches scapiform, 4–6 dm. high, glabrous or minutely glandular-puberulent; petioles 5–15 cm. long, glabrous or minutely glandular-puberulent; leaf-blades reniform or rounded, deeply cordate at the base, thin, glabrous, round-lobed and crenate, with rounded or ovate, ciliate and bristle-tipped teeth; hypanthium deeply campanulate, greenish, glandular-puberulent, together with the oblong obtuse sepals about 6 mm. long; petals oblanceolate, ½–⅔ as long as the sepals.

TYPE LOCALITY: Near the Dalles, Oregon.
DISTRIBUTION: Hillsides of Idaho, Washington and Oregon.

X. **Sanguineae**: Species with rather open but few-flowered inflorescence, red flowers, deeply campanulate hypanthium, included stamens, petals, pistils and fruit, oblanceolate petals about half as long as the sepals and inserted low down in the tube.

70. **Heuchera sanguinea** Engelm. in Wisliz. Tour N. Mex. 107. 1846.

Acaulescent; flowering branches sparingly hirsute or puberulent, scapiform, 2–4 dm. high, naked or with a few bracts; petioles 4–10 cm. long, hirsute with white hairs; leaf-

blades reniform, 2–4.5 cm. in diameter, round-lobed with a few broad, ovate or rounded cuspidate teeth, glabrous above, hirsute on the veins beneath; hypanthium bright-red, campanulate, puberulent, together with the oblong-oval sepals about 8 mm. long; petals oblanceolate, about half as long as the sepals; filaments inserted above the middle of the hypanthium, only slightly longer than the anthers.

TYPE LOCALITY: Porphyry mountains of Llanos (New Mexico).
DISTRIBUTION: Shaded cliffs in New Mexico, Arizona and northern Mexico.
ILLUSTRATION: E. & P. Nat. Pfl. 3^{2a}: *f. 29, M, N.*

71. **Heuchera Townsendii** Rydb. sp. nov.

Acaulescent; flowering branches sparingly hirsute, scapiform, 2–4 dm. high; petioles 5–8 cm. long, very hirsute; blades reniform, 2–4 cm. broad, round-lobed and with broadly ovate acuminate and bristle-pointed teeth, sparingly hirsute on both sides or glabrate, thin; hypanthium dark-crimson, cylindro-campanulate, together with the oblong obtuse sepals about 9 mm. long; petals oblanceolate, scarcely half as long as the sepals; filaments inserted near the base of the hypanthium, many times as long as the anthers.

Type collected in the Sierra Madre, near Colonia Garcia, Chihuahua, Mexico, in 1899, by Townsend & Barber, *no. 3.*

72. **Heuchera pulchra** Rydb. sp. nov.

Acaulescent; flowering branches hirsute, 4–5 dm. high, often with 1 or 2 small leaves; petioles of the basal leaves 5–12 cm. long, hirsute; blades reniform, 4–8 cm. wide, round-lobed and crenate with very broad, often truncate and mucronate teeth, finely puberulent or nearly glabrous above, more or less hirsute beneath; hypanthium deeply campanulate, light-crimson, hirsutulous, together with the rounded sepals about 8 mm. long; petals oblanceolate, about half as long as the sepals; stamens inserted near the middle of the hypanthium.

Type collected in the Sabenio Cañon, Arizona, in 1901, by David Griffiths.

DOUBTFUL SPECIES

Heuchera erubescens Braun & Bouché, Ind. Sem. Hort. Berol. **1871**: App. 2. Described from specimens raised from seed, said to come from Costa Rica. No species of *Heuchera* is known from there and the diagnosis describes very well *H. micrantha* of our West Coast. A. Braun compared it also with a specimen collected in California by Bridges, and states that *H. erubescens* has more conspicuous glands on the peduncles than that specimen.

Heuchera macrophylla Lodd.; G. Don, in Loud. Hort. Britt. 90. 1830. Hardly more than a nomen nudum and altogether indeterminable.

Heuchera obtusissima Regel & Rach, Ind. Sem. Hort. Petrop. **1856**: 31, and *Heuchera undulata* Regel & Rach, *loc. cit.* Unknown, as it has been impossible to consult the original descriptions.

13. **TIARELLA** L. Sp. Pl. 405. 1753.

Petalosteira Raf. Fl. Tell. **2**: 74. 1836.
Blondia Necker (Elem. **2**: 115. 1790, hyponym); Raf. Fl. Tell. **2**: 75. 1836.

Perennial herbs with scaly rootstocks and lateral leafy flowering branches. Stipules present. Inflorescence racemose or paniculate. Hypanthium small, short-campanulate, almost free from the gynoecium. Sepals 5, ovate or lanceolate. Petals clawed with oblong or elliptic blades or else clawless and filiform. Stamens 10, exserted, with long filiform filaments. Gynoecium 1-celled, with 2 parietal nearly basal placentae. Capsule membranaceous, with 2 very unequal valves. Seeds few.

Type species, *Tiarella cordifolia* L.

Inflorescence simply racemose; blades of petals elliptic to oblong; Atlantic species.
  Flowering branches scapiform or rarely with a small leaf; lobes of the leaves broadly ovate, acutish. — 1. *T. cordifolia.*
  Flowering branches leafy; lobes of the leaves broadly triangular, very acute. — 2. *T. macrophylla.*
Inflorescence more or less compound; flowering branches leafy; petals filiform or subulate; Pacific species.
  Leaves not ternate-compound.

Stem and petioles glabrous or sparingly hirsute; upper sepal not much larger than the others. 3. *T. unifoliata.*
Stem and petioles strongly and densely hirsute; upper sepal much larger than the others, obtuse. 4. *T. californica.*
Leaves ternate-compound.
Divisions of the leaves slightly lobed and crenate. 5. *T. trifoliata.*
Divisions of the leaves laciniate. 6. *T. laciniata.*

1. **Tiarella cordifolia** L. Sp. Pl. 405. 1753.

Perennial acaulescent plant with sarmentose runners before the close of the season; flowering branches 1.5–4 dm. high, hirsute with white retrorse hairs, scapiform or with a few scales or a single small leaf; petioles of basal leaves about 1 cm. long, also hirsute; blades broadly cordate in outline, 3–7-lobed, usually acutish, sparingly hirsute on both sides, 4–10 cm. broad; lobes and teeth broadly rounded-ovate, the latter mucronate; leaf of the flowering branch similar, but small and short-petioled; inflorescence a simple raceme, glandular-puberulent; sepals white, oblong, obtuse, about 2 mm. long; petals oblong or oblanceolate, clawed, acute, white, about half longer than the sepals; carpels ovate, acute, the larger about 9 mm., the smaller 6 mm. long.

TYPE LOCALITY: America.
DISTRIBUTION: In rich moist woods, Nova Scotia to Minnesota and south to Georgia and Alabama.
ILLUSTRATIONS: Lam. Tab. Encyc. **2**: *pl. 373, f. 1;* Bot. Mag. *pl. 1589;* Baillon, Hist. Pl. **3**: *f. 371;* E. & P. Nat. Pfl. 3^{2a}: *f. 29, A–D.*

2. **Tiarella macrophylla** Small, Fl. SE. U. S. 501. 1903.

Acaulescent perennial with sarmentose runners and racemose inflorescence; flowering branches 3–4-leaved, glandular-puberulent; petioles of basal leaves glabrous, 1.5–2 dm. long; blades reniform or broadly cordate in outline, glabrous, 12–15 cm. broad, coarsely 7-lobed, with triangular, very acute lobes and broadly ovate, mucronate teeth; leaves of the flowering branches and the runners smaller, with more cordate blades, and puberulent on the veins; racemes about 2 dm. long, glandular-pubescent; flowers as in the preceding, so also the fruit, but the larger carpel more obtuse.

TYPE LOCALITY: Tryon Mountain, North Carolina.
DISTRIBUTION: Mountains of North Carolina.

3. **Tiarella unifoliata** Hook. Fl. Bor. Am. **1**: 238. 1832.

Petalosteira unifoliata Raf. Fl. Tell. **2**: 74. 1836.
Tiarella trifoliata unifoliata Kurtz, Bot. Jahrb. **19**: 378. 1894.

Perennial with a cespitose rootstock, acaulescent; flowering branches 1.5–4 dm. high, glabrous or viscid-puberulent above, or slightly hirsute. 1–4-leaved; petioles of basal leaves 0.5–1.5 dm. long, glabrous or slightly hirsute; blades broadly cordate, sparingly hirsute or in age glabrate, 4–10 cm. wide, coarsely 3–5-lobed, with broadly ovate acute lobes, doubly crenate with mucronate teeth; leaves of the flowering branches similar but with shorter petioles; inflorescence a narrow panicle; sepals whitish, ovate-oblong, about 1.5 mm. long; the linear-subulate white petals and the stamens fully 3 times as long; carpels oblong, acutish, the longer 9–11 mm., the shorter 5–6 mm. long.

TYPE LOCALITY: Height of land in the Rocky Mountains, near the source of the Columbia.
DISTRIBUTION: Shaded ravines and woods, from Alberta and British Columbia to Idaho and northern California.
ILLUSTRATION: Hook. Fl. Bor. Am. *pl. 81.*

4. **Tiarella californica** (Kellogg) Rydb.

Heuchera californica Kellogg, Proc. Calif. Acad. **5**: 53. 1873.
Tiarella unifoliata procera A. Gray, Bot. Calif. **1**: 199. 1876.

Perennial, with a more or less branched rootstock; flowering branches 4–5 dm. high, strongly hirsute with long divaricate hairs, 2–4-leaved; petioles 5–20 cm. long, strongly hirsute; blades broadly cordate or reniform, hirsute on both sides, 5–10 cm. wide, 3–5-lobed, with rounded ovate acutish or obtusish lobes, doubly crenate with rounded mucronate teeth; leaves of the flowering branches short-petioled and smaller and with more acute lobes; inflorescence a narrow panicle; sepals whitish, oval-oblong, obtusish, the upper much

larger, about 3 mm. long; the linear-subulate petals and stamens not twice as long; carpels oblong, acute, the larger 10–12 mm. long, the smaller about half that length.

TYPE LOCALITY: San Gregorio Creek, San Mateo County, California.
DISTRIBUTION: Near the coast of middle California from Mendocino to San Mateo County.

5. **Tiarella trifoliata** L. Sp. Pl. 406. 1753.

Tiarella stenopetala Presl, Rel. Haenk. **2**: 55. 1831.
Blondia trifoliata Raf. Fl. Tell. **2**: 75. 1836.
Tiarella rhombifolia Nutt.; T. & G. Fl. N. Am. **1**: 588. 1840.

Acaulescent perennial; flowering branches slender, 2–6 dm. high, glabrous below, glandular-hirsute above, 2–4-leaved; leaves trifoliolate; petioles of the basal ones 5–15 cm. long, glabrous or sparingly hirsutulous; middle leaflet rhombic, more or less 3-lobed and double-toothed with broadly ovate teeth, sparingly hirsute or glabrous in age, 2–8 cm. long; lateral leaflets obliquely ovate, 2-cleft; leaves of the flowering branches similar but smaller; inflorescence a narrow panicle; sepals oblong, acute, about 1.5 mm. long; petals white, linear-subulate, as well as the stamens 3–4 times as long; carpels oval, obtusish, the larger about 7 mm., the smaller 4 mm. long.

TYPE LOCALITY: Northern Asia.
DISTRIBUTION: In woods from Alaska to Oregon; also in eastern Asia.

6. **Tiarella laciniata** Hook. Fl. Bor. Am. **1**: 239. 1832.

Petalosteira laciniata Raf. Fl. Tell. **2**: 74. 1836.
Tiarella trifoliata laciniata Wheelock, Bull. Torrey Club **23**: 72. 1896.

Acaulescent perennial; flowering branches 3–4 dm. high, glabrous or sparingly glandular-hirsute above; leaves trifoliolate; petioles of the basal ones sparingly hirsute or glabrate; middle leaflet sparingly hirsute, rhombic in outline, deeply twice-cleft and with oblong or ovate mucronate teeth, 2–6 cm. long; lateral ones obliquely ovate, 2-cleft to near the base and then cleft and toothed as the middle one; leaves of the flowering branches similar but smaller and the upper short-petioled; flowers and fruit as in the preceding.

TYPE LOCALITY: Northwest coast of America.
DISTRIBUTION: In woods, British Columbia and Washington.
ILLUSTRATION: Hook. Fl. Bor. Am. *pl. 77.*

14. **BOLANDRA** A. Gray, Proc. Am. Acad. **7**: 341. 1868.

Perennial, glabrous or glandular-puberulent herbs with short bulbiferous rootstocks. Stem leafy. Leaves (at least the stem-leaves) with conspicuous stipules and reniform blades. Flowers paniculate with more or less leafy bracts. Hypanthium deeply urceolate, free from the ovary. Sepals 5, long-attenuate. Petals 5, purplish, narrowly subulate-lanceolate, long-attenuate, persistent. Stamens 5, opposite to the sepals; filaments subulate; anthers 2-lobed. Carpels 2, lance-ovate, united below; placentae axial; seeds pendulous.

Type species, *Bolandra californica* A. Gray.

Lobes and teeth of the leaves rounded, mucronate; sepals 3–4 mm. long. 1. *B. californica.*
Lobes and teeth of the leaves triangular, acute; sepals 8–10 mm. long. 2. *B. oregana.*

1. **Bolandra californica** A. Gray, Proc. Am. Acad. **7**: 341. 1868.

Stem 1–3 dm. high, very slender, glabrous below, glandular-puberulent above; basal and lower cauline leaves petioled; petioles 3–10 cm. long; blades reniform, glabrous, thin, 5–7-lobed and coarsely toothed; lobes and teeth rounded-ovate; upper cauline leaves sessile, ovate, toothed; the middle ones often auricled by the union of the stipules and the blades; hypanthium without the sepals about 5 mm. long; sepals lanceolate, about 3 mm. long, attenuate; petals subulate-lanceolate, long-attenuate, slightly exceeding the sepals.

TYPE LOCALITY: Yosemite Valley, on the Mariposa Trail, among rocks.
DISTRIBUTION: On wet rocks of the Sierra Nevada, California.

2. **Bolandra oregana** S. Wats. Proc. Am. Acad. **14**: 292. 1879.

Stem stouter than in the preceding, glandular-puberulent above, 2–6 dm. high; basal leaves and lower stem-leaves long-petioled; blades reniform with a narrow sinus, thin, glabrous, acutely lobed with many triangular-ovate acute lobes and with smaller acute teeth;

middle stem-leaves short-petioled, with very large stipules, the upper sessile and often auricled at the base; hypanthium without the sepals 6 mm. long; sepals linear-lanceolate, long-attenuate, 6–10 mm. long; petals similar but narrower and still more attenuate; carpels about 1 cm. long.

TYPE LOCALITY: On wet rocky banks of the Willamette River near Oregon City, Oregon.
DISTRIBUTION: Rocky banks and river bluffs, Oregon and Washington.
ILLUSTRATION: E. & P. Nat. Pfl. 3^{2a}: *f. 26, F, G.*

15. **JEPSONIA** Small, Bull. Torrey Club **23**: 18. 1896.

Perennial acaulescent herbs, with bulb-like rootstocks supporting a short caudex and several slender autumnal scapes. Leaves alternate, all basal, vernal; blades about as broad as long, shallowly lobed and toothed, cordate at the base, petioled. Flowers in terminal cymes. Hypanthium with a flat base. Sepals 5, partially united into a campanulate, somewhat corolloid, veiny tube which surmounts the hypanthium. Corolla white or nearly so, regular. Petals 5, of a spatulate type, withering-persistent, the claws partially adnate to the calyx-tube. Filaments adnate to the calyx-tube, but not as high up as the petals. Ovary superior, the 2 carpels united to about the middle. Follicles veiny, the bodies filling the calyx-tube, the slender beaks diverging at a right angle. Seeds prominently 4-ridged.

Type species, *Saxifraga Parryi* Torr.

Calyx-lobes shorter than the tube and hypanthium; leaf-blades suborbicular, broader than long.
- Hypanthium flat; calyx-tube narrowly campanulate; sinus of the leaf-blade open. — 1. *J. Parryi.*
- Hypanthium turbinate; calyx-tube open-campanulate; sinus of the leaf-blade closed by the overlapping lobes. — 2. *J. heterandra.*

Calyx-lobes as long as the tube and hypanthium or longer; leaf-blades ovate-orbicular, longer than broad. — 3. *J. malvifolia.*

1. **Jepsonia Parryi** (Torr.) Small, Bull. Torrey Club **23**: 18. 1896.

Saxifraga Parryi Torr. Bot. Mex. Bound. Surv. 69. 1859.

Caudex often branched, clothed with the firm persistent leaf-bases; leaves erect, the petioles becoming 2–6 cm. long, sparingly pubescent, the blades suborbicular, broader than long, 2.5–6 cm. broad, shallowly several-lobed and toothed, shallowly or sometimes rather deeply cordate at the base, the sinus usually widely open; scapes often tufted, wiry, 1–3 dm. tall, glabrous or nearly so in age; calyx-lobes ovate, mostly 1–1.5 mm. long, much shorter than the narrowly campanulate tube and hypanthium; hypanthium narrow, with a flat base; petals 3–4 mm. long, the blades obovate to oval, somewhat purplish-veined, narrowed into short claws; follicles protruding beyond the calyx, the bodies 5–6 mm. long, flat at the base, the tips much shorter than the bodies.

TYPE LOCALITY: Dry hills near San Diego and San Luis Rey, California.
DISTRIBUTION: On hillsides, southern California.
ILLUSTRATIONS: Torr. Bot. Mex. Bound. Surv. *pl. 25;* Bull. Torrey Club **23**: *pl. 265.*

2. **Jepsonia heterandra** Eastw. Bull. Torrey Club **32**: 201. 1905.

Caudex simple or branched, often thick and woody, scaly; leaves erect or ascending, the petioles becoming 2.5–5 cm. long, usually hirsute, the blades suborbicular, 3.5–6 cm. broad, shallowly lobed and toothed, more or less pubescent about the veins beneath, deeply cordate, the basal lobes strongly overlapping; scapes often tufted, 1–3.3 dm. tall, finely pubescent at least when young; calyx-lobes broadly ovate, about 2 mm. long, somewhat shorter than the campanulate tube and hypanthium; hypanthium broad, with a turbinate base, ultimately slightly veiny; petals 5–6 mm. long, the blades ovate to oval, abruptly narrowed into short claws; follicles long-exserted beyond the calyx, the bodies 5–6 mm. long, turbinate at the base, the tips slightly shorter than the bodies.

TYPE LOCALITY: Mariposa County, California.
DISTRIBUTION: Ravines, middle California.

3. **Jepsonia malvifolia** (Greene) Small, Bull. Torrey Club **23**: 19. 1896.

Saxifraga malvaefolia Greene, Bull. Torrey Club 9: 121. 1882.

Similar to *J. Parryi* in habit; leaf-blades relatively longer, ovate-orbicular, thus longer than broad; calyx-lobes as long as the tube and hypanthium.

TYPE LOCALITY: Santa Rósa Island, California.
DISTRIBUTION: Santa Rosa and Santa Cruz Islands.

16. **HEMIEVA** Raf. Fl. Tell. **2**: 70. 1836.

Glandular-puberulent perennials, with a very short bulbiferous rootstock and fibrous roots. Blades of basal leaves ternately divided with crenate lobes; stem-leaves with more or less developed stipules. Flowers in a corymbiform panicle. Hypanthium campanulate, adnate to the lower half of the ovary. Sepals 5, triangular-lanceolate. Petals 5, obovate, short-clawed. Stamens 5, opposite to the sepals, erect, inserted on the outer margin of a thick disk; filaments filiform. Gynoecium half inferior, 2-celled, with axial placentae; styles distinct.

Type species, *Saxifraga ranunculifolia* Hook.

1. **Hemieva ranunculifolia** (Hook.) Raf. Fl. Tell. **2**: 70. 1836.

Saxifraga ranunculifolia Hook. Fl. Bor. Am. **1**: 246. 1832.
Boykinia ranunculifolia A. Gray, Am. Jour. Sci. **42**: 21. 1842.
Suksdorfia ranunculifolia Engler; E. & P. Nat. Pfl. 3^{2a}: 52. 1890.

Light-green plants; stem about 2 dm. high, more or less glandular-pubescent; lower leaves long-petioled; petioles 5–10 cm. long, glabrous, or sparingly pubescent; blades ternately divided to the base, the middle division broadly cuneate, 1–2.5 cm. long, and rounded 3-lobed, the lateral ones oblique and 4-lobed; middle leaves similar but with shorter petioles, which are dilated at the base; the uppermost sessile, merely 3-lobed at the apex; inflorescence short and corymbiform; hypanthium campanulate, about 2 mm. long; sepals ovate, about 2 mm. long; petals white or ochroleucous, broadly spatulate with very short claws.

TYPE LOCALITY: On the high grounds around the Kettle Falls of the Columbia.
DISTRIBUTION: Wet rocks in the mountains, from Alberta and British Columbia to Montana and Oregon.
ILLUSTRATION: Hook. Fl. Bor. Am. *pl. 83.*

17. **SUKSDORFIA** A. Gray, Proc. Am. Acad. **15**: 42. 1879.

Slender, glandular-pubescent perennials, with a bulblet-bearing rootstock; flowering shoots axial, leafy. Blades of basal leaves merely crenate; stem-leaves with stipules. Inflorescence a few-flowered panicle. Hypanthium deeply campanulate or urn-shaped, adnate to the larger portion of the gynoecium. Sepals 5, lanceolate, erect. Petals 5, long-clawed, purple or rose, occasionally lobed, imbricated. Stamens 5, opposite to the sepals; disk obsolete; anthers almost sessile. Gynoecium 2-celled, with axial, many-ovuled placentae, almost wholly inferior; styles short; stigma truncate. Capsule dehiscent between the styles.

Type species, *Suksdorfia violacea* A. Gray.

1. **Suksdorfia violacea** A. Gray, Proc. Am. Acad. **15**: 42. 1879.

Hemieva violacea Wheelock, Bull. Torrey Club **23**: 71. 1896.

Slender plants; stem 2–3 dm. high, more or less glandular-pubescent; petioles of basal leaves 2–8 cm. long, glandular-puberulent; blades reniform with 5–7 round lobes, 1–3 cm. wide, more or less puberulent; lower stem-leaves similar with broad toothed stipules; the upper subsessile, cuneate, and 1–4-toothed at the apex; inflorescence a more or less elongated, few-flowered panicle; hypanthium campanulate, 2.5 mm. long, in fruit elliptic and 6–7 mm. long; sepals lanceolate, about 2 mm. long; petals pink, 5–7 mm. long, spatulate, long-clawed and almost erect.

TYPE LOCALITY: Wet rocks on the Columbia River, in Washington, near the junction of the White Salmon River.
DISTRIBUTION: Wet cliffs near streams, Montana, Washington, Idaho and Oregon.
ILLUSTRATION: E. & P. Nat. Pfl. 3^{2a}: *f. 26, M–O.*

18. **SULLIVANTIA** T. & G. Am. Jour. Sci. **42**: 22. 1842.

Perennial acaulescent slender herbs, with small rootstocks and scape-like stems. Leaves alternate, mostly basal, only one on the lower part of the stem; blades reniform to orbicular in outline, shallowly lobed and often coarsely toothed, cordate at the base, long-petioled. Flowers in panicled cymes. Hypanthium campanulate, longer than the calyx. Sepals 5, erect. Corolla white or whitish, regular. Petals 5, persistent, clawed. Stamens

5; filaments subulate. Ovary fully half-inferior, the carpels united to the beaks. Follicles erect, well included in the drooping hypanthium. Seeds winged.

Type species, *Saxifraga Sullivantii* T. & G.

Sepals 1-nerved.
- Petals 3 mm. long, the blades spatulate, gradually narrowed into the claws. 1. *S. Sullivantii.*
- Petals 1.5 mm. long, the blades oval or obovate, abruptly narrowed into the claws. 2. *S. oregana.*

Sepals 3-nerved.
- Petals with spatulate or narrowly oblong blades gradually narrowed into the claws. 3. *S. halmicola.*
- Petals with obovate or oval-rhombic blades rather abruptly narrowed into the claws. 4. *S. Hapemani.*

1. **Sullivantia Sullivantii** (T. & G.) Britton, Mem. Torrey Club **5**: 178. 1894.

Saxifraga (?) Sullivantii T. & G. Fl. N. Am. **1**: 575. 1840.
Sullivantia ohioensis T. & G. Am. Jour. Sci. **42**: 22. 1842.

Stems 1–4 dm. tall, glandular-pubescent; leaf-blades reniform to orbicular, 3–11 cm. in diameter, shallowly and broadly several–many-lobed, the lobes entire or slightly toothed, the petioles longer than the blades, glabrous or nearly so; sepals ovate, 1–1.5 mm. long, 1-nerved; petals 3 mm. long, the blades flat and entire, spatulate, gradually narrowed into the claws; follicles 5–6 mm. long.

TYPE LOCALITY: Highland County, Ohio.
DISTRIBUTION: Ohio and Indiana.
ILLUSTRATIONS: Mem. Am. Acad. II. **3**: *pl. 6;* Britt. & Brown, Ill. Fl. *f. 1841.*

2. **Sullivantia oregana** S. Wats. Proc. Am. Acad. **14**: 292. 1879.

Stems 1–3 dm. tall, sparingly and inconspicuously glandular-pubescent; leaf-blades reniform to reniform-orbicular, 2.5–5 cm. in diameter, more deeply lobed than those of *S. Sullivantii*, the lobes laciniately toothed, the petioles much longer than the blades, essentially glabrous; sepals ovate, about 1 mm. long, 1-nerved; petals 1.5 mm. long, the blades crisped-crenulate, oval to obovate, abruptly narrowed into the claws; follicles about 4 mm. long.

TYPE LOCALITY: Willamette River, near Oregon City, Oregon.
DISTRIBUTION: Oregon.
ILLUSTRATION: E. & P. Nat. Pfl. 3^{2a}: *f. 26, K, L.*

3. **Sullivantia halmicola** A. Nelson, sp. nov.

Stems 1–3.5 dm. tall, more or less glandular-pubescent; leaf-blades reniform to orbicular-reniform, 1.5–8.5 cm. in diameter, shallowly lobed, the lobes coarsely toothed, the petioles as long as the blades or much longer, glabrous or nearly so; sepals ovate-oblong, 1.5–2 mm. long, 3-nerved; petals 2 mm. long, the blades gradually narrowed into the claws; follicles 5–6 mm. long.

Type collected at Hat Six Creek, Casper Mountain, Wyoming, Aug. 7, 1898, by E. Nelson, *no. 5032*.
DISTRIBUTION: Wyoming.

4. **Sullivantia Hapemani** (Coult. & Fisher) Coulter, Bot. Gaz. **17**: 421. 1892.

Heuchera Hapemani Coult. & Fisher, Bot. Gaz. **17**: 348. 1892.
Boykinia Purpusii Brand. Bot. Gaz. **27**: 447. 1899.
Therofon Purpusii Heller, Cat. N. Am. Pl. ed. 2. 5. 1900.

Stems 1–2 dm. tall, sparingly glandular-pubescent; leaf-blades reniform or orbicular-reniform, 2–8.5 cm. in diameter, rather shallowly lobed, the lobes coarsely toothed, the petioles much longer than the blades, essentially glabrous; sepals ovate or oblong-ovate, 1.5–2 mm. long, 3-nerved; petals 3 mm. long, the blades obovate or oval-rhombic, rather abruptly narrowed into the claws; follicles 4–5 mm. long.

TYPE LOCALITY: Big Horn Mountains, Wyoming.
DISTRIBUTION: Wisconsin to Minnesota, Wyoming and Colorado.

19. THEROPHON Raf. New Fl. 4: 66. 1836. (*Therofon.*)

Boykinia Nutt. Jour. Acad. Phila. 7: 113. 1834. Not *Boykinia* Raf. 1828.

Glandular-pubescent perennial herbs with a scaly rootstock. Flowers perfect, paniculate on leafy lateral shoots. Leaf-blades reniform, variously cleft or lobed and dentate or crenate; stipules usually present, either leafy or reduced to bristles. Hypanthium campanulate, urceolate or turbinate, adnate to the lower half of the ovary. Sepals 5, lanceolate or ovate-lanceolate. Petals 5, white, obovate or spatulate, often short-clawed. Stamens 5, with short filaments opposite to the sepals. Ovary and capsule usually 2-celled, opening between the beaks; styles 2, distinct and in fruit forming two divergent beaks. Placentae axial; seeds numerous with shining minutely punctate testa.

Type species, *Boykinia aconitifolia* Nutt.

Leaves cleft or incised with acute teeth.
- Stipules present, foliaceous.
  - Blades of petals broadly oval, obovate or nearly orbicular; leaves with narrow sinuses at the base; branches of the inflorescence many-flowered. — 1. *T. majus.*
  - Blades of the petals spatulate; leaves with open sinuses at the base; branches of the inflorescence axillary and few-flowered. — 2. *T. intermedium.*
- Stipules wanting or represented by bristles.
  - Hypanthium in fruit decidedly turbinate at the base; teeth of the leaves rounded-ovate. — 3. *T. turbinatum.*
  - Hypanthium in fruit obtuse or rounded at the base; teeth of the leaves lanceolate, ovate or triangular.
    - Branches of the inflorescence dichotomous-cymose with two racemiform (at least in fruit) secund branches; pedicels curved.
      - Hypanthium in fruit almost spherical; beaks of the fruit scarcely equaling the triangular-lanceolate sepals. — 4. *T. aconitifolium.*
      - Hypanthium in fruit ovoid; beaks of the fruit surpassing the lanceolate sepals.
        - Hypanthium densely glandular, more or less purplish; leaf-blades comparatively firm; petioles decidedly hirsute. — 5. *T. cincinnatum.*
        - Hypanthium sparingly glandular, green; leaf-blades very thin; petioles glabrous or with a few scattered hairs. — 6. *T. occidentale.*
    - Branches of the inflorescence irregularly cymose, neither racemiform nor secund; pedicels straight even in fruit.
      - Sepals in fruit erect or ascending; inflorescence densely glandular and usually purplish. — 7. *T. elatum.*
      - Sepals in fruit reflexed or spreading; inflorescence puberulent and with a few glandular hairs, green. — 8. *T. vancouverense.*

Leaves merely rounded-lobed, crenate with broad, mucronate teeth.
- Panicle open; petals small, scarcely longer than the sepals. — 9. *T. rotundifolium.*
- Panicle congested; petals large, about twice as long as the sepals. — 10. *T. Richardsoni.*

1. Therophon majus (A. Gray) Wheelock, Bull. Torrey Club 23: 70. 1896.

Boykinia occidentalis elata A. Gray, Proc. Am. Acad. 8: 383, in part, *i. e.*, as to Hall's plant. 1872. Not *Saxifraga elata* Nutt. 1840.
Boykinia major A. Gray, Bot. Calif. 1: 196. 1876.

Tall and stout; stem 3–10 dm. high, more or less glandular-villous with brown hairs; basal leaves and lower stem-leaves long-petioled, with scarious stipules; petioles 1–2 dm. long, also glandular-villous; blades reniform in outline, glabrous, except the veins beneath, 5–15 cm. in diameter, 7-cleft about halfway down, again cleft and coarsely serrate with lance-ovate glandular-tipped teeth; middle stem-leaves similar but with shorter petioles and large foliaceous stipules; the uppermost ovate and sessile; hypanthium campanulate, without the sepals 2–3 mm. long, glandular-puberulent; sepals lanceolate, 3 mm. long; petals white, 5–7 mm. long; blades broadly oval or obovate with long claws.

TYPE LOCALITY: Wooded region of Sierra Nevada from Mariposa County northward.
DISTRIBUTION: Wooded regions from Montana, Idaho and Washington to southern California.
ILLUSTRATION: E. & P. Nat. Pfl. 3^{2a}: *f. 26, H, J.*

2. Therophon intermedium (Piper) Heller, Muhlenbergia 1: 53. 1904.

Boykinia major intermedia Piper, Erythea 7: 172. 1899.

Tall but rather slender; stem 4–5 dm. high, angled and striate, sparsely glandular-hirsute; basal leaves with petioles about 1.5 dm. long; blades reniform with an open sinus and more or less cuneate at the very base, fully 1 dm. broad, glabrous except the veins be-

neath, 5–7-cleft, the divisions broadly cuneate and sharply toothed; cauline similar but short-petioled, or the upper deltoid and sessile; stipules semi-rotund or the upper lanceolate; peduncles slender, axillary to most of the leaves, few-flowered and cymose; hypanthium campanulate, without the sepals 2–2.5 mm. long; sepals lanceolate, 3 mm. long; petals spatulate, about 5 mm. long.

TYPE LOCALITY: New London, Chehalis County, Idaho.
DISTRIBUTION: Known only from the type locality.

3. **Therophon turbinatum** Rydb. sp. nov.

Tall, erect; stem about 6 dm. high, glabrous below, glandular-puberulent above; basal and lower cauline leaves with glabrous petioles, 5–15 cm. long, and bristle-like stipules; blades glabrous, thin, reniform, 5–7-cleft and toothed with broadly ovate, glandular-mucronate teeth; upper stem-leaves short-petioled and with orbicular blades; hypanthium campanulate, glandular-puberulent, 2–3 mm. long, in fruit ellipsoid and distinctly acute at the base and about 8 mm. long.

Type collected on banks of a stream among the mountains, northern Alabama, by S. B. Buckley.

4. **Therophon aconitifolium** (Nutt.) Millsp. Bull. W. Va. Agric. Exp. Sta. 2: 361. 1892.

Boykinia aconitifolia Nutt. Jour. Acad. Phila. 7 · 113. 1834.
Therofon napelloides Raf. New Fl. 4: 66. 1836.
Saxifraga aconitifolia Field. & Gardn. Sert. Pl. *pl. 57.* 1844.

Tall; stem 3-7 dm. high, sparingly glandular-villous with brown hairs; basal and lower cauline leaves long-petioled and with bristle-like stipules; petioles 1–2 dm. long, glabrous or sparingly villous-hirsute; blades reniform with a shallow sinus at the base, glabrous, 5–9-cleft halfway down and sharply incised with lanceolate or ovate teeth; upper stem-leaves short-petioled or the uppermost sessile and ovate; hypanthium campanulate, without the sepals 1.5 mm. long or in fruit spherical and 4 mm. long, glandular; sepals triangular-lanceolate; petals white, spatulate or obovate, 3 mm. long.

TYPE LOCALITY: In the valleys of the Allegheny Mountains (probably in Virginia or North Carolina).
DISTRIBUTION: In woods from Virginia to Tennessee and Georgia.
ILLUSTRATION: Field. & Gardn. Sert. Pl. *pl. 57.*

5. **Therophon cincinnatum** Rosendahl & Rydb. sp. nov.

Usually robust; stem 3–6 dm. high, with scattered brown hairs below and densely glandular above, often purplish; basal leaves and lower stem-leaves long-petioled; petioles 4–15 cm. long, usually decidedly brown-hirsute; blades reniform or cordate, 4–10 cm. broad, 5–7-cleft and double-toothed with lance-ovate bristle-pointed teeth, hairy on the veins, otherwise glabrous, rather firm; upper stem-leaves short-petioled or subsessile, often truncate at the base; inflorescence purplish; bractlets thick, lanceolate to linear-subulate, densely glandular and persistent; hypanthium campanulate, 3 mm. long, densely glandular, in fruit ovoid, 4–5 mm. long; sepals narrowly lanceolate and more or less glandular; petals white, spatulate, 3–4 mm. long.

Type collected on rocky banks of streams, Santa Cruz, California, in 1882, by C. G. Pringle.
DISTRIBUTION: Rocky banks of streams from California to Washington.

6. **Therophon occidentale** (T. & G.) Rydb.

Boykinia occidentalis T. & G. Fl. N. Am. 1: 577. 1840.
Boykinia elata Greene, Fl. Fran. 190, in part. 1891.
Therofon elatum Greene, Man. Bay Reg. 121, in part. 1894.

Slender; stem 2–6 dm. high, glabrous or nearly so below, puberulent and slightly glandular above; petioles of the basal leaves 5–15 cm. long, glabrous or nearly so; blades reniform, thin, 5–7-cleft and double-toothed with broadly ovate teeth, basal sinus deep and narrow; lower stem-leaves similar but with more open basal sinus; upper stem-leaves usually with truncate bases and more ovate; inflorescence puberulent and more or less glandular; bractlets lanceolate, thin and usually deciduous; hypanthium campanulate, 2–3

mm. long, somewhat glandular below, in fruit ovoid, 4–5 mm. long; sepals lanceolate, glabrous or nearly so, in fruit exceeded by the styles; petals white, spatulate, 4–6 mm. long.

TYPE LOCALITY: Oregon.
DISTRIBUTION: Along streams from California to British Columbia.

7. **Therophon elatum** (Nutt.) Greene, Man. Bay Reg. 121, in part. 1894.

Saxifraga elata Nutt.; T. & G. Fl. N. Am. **1**: 575. 1840.
Boykinia occidentalis elata A. Gray, Proc. Am. Acad. **8**: 383, *i. e.*, as to synonym. 1872.
Boykinia elata Greene, Fl. Fran. 190, in part. 1891.
Boykinia Nuttallii J. M. Macoun, Can. Rec. Sci. **6**: 408. 1895.

Low and slender; stem 1.5–3 dm. high, more or less brown-hairy below, densely glandular and purplish above; petioles of the basal leaves 3–6 cm. long, hirsute with brown hairs; blades reniform or cordate, 2–5 cm. wide, deeply 5–7-cleft, more or less hirsute on the veins, incised, with lanceolate bristle-pointed teeth; lower stem-leaves similar, the upper short-petioled; inflorescence small, densely glandular; hypanthium campanulate, about 2.5 mm. long, glandular below, purplish, in fruit ovoid, 3–4 mm. long; sepals narrowly lanceolate, in fruit surpassed by the styles; petals white, oblanceolate or spatulate.

TYPE LOCALITY: Chinook Point at the estuary of the Oregon (Columbia River).
DISTRIBUTION: Gravelly banks and beaches from Oregon to Vancouver Island.

8. **Therophon vancouverense** Rydb. sp. nov.

Very slender; stem about 3 dm. high, with scattered brown hairs below, puberulent and slightly glandular above; basal petioles about 1 dm. long, with scattered hairs; blades reniform, 4–5 cm. wide, 7-cleft, thin, somewhat hairy on the veins, incised with lanceolate bristle-pointed teeth; sinus narrow; stem-leaves similar but with more open sinus; inflorescence small, puberulent and somewhat glandular; hypanthium campanulate, scarcely 2 mm. long, puberulent below or slightly glandular, in fruit about 2.5 mm. long, ovoid; sepals narrowly lanceolate, in fruit reflexed or spreading; petals spatulate, about 2.5 mm. long.

Type collected on Vancouver Island, Aug. 1, 1874, by Harry Edwards.
DISTRIBUTION: Known only from Vancouver Island.

9. **Therophon rotundifolium** (Parry) Wheelock, Bull. Torrey Club **23**: 70. 1896.

Boykinia rotundifolia Parry; A. Gray, Proc. Am. Acad. **13**: 371. 1878.

Very tall and stout; stem 6–10 dm. high, densely glandular-villous; basal and lower cauline leaves long-petioled; petioles 1–1.5 dm. long, also densely glandular-villous; blades reniform, sparingly hairy on the veins, 1–1.5 dm. in diameter, with numerous shallow rounded, crenate lobes; upper stem-leaves short-petioled and orbicular; hypanthium 3–3.5 mm. long, campanulate-urceolate, strongly striate, glandular-pubescent; sepals ovate-lanceolate, 2 mm. long; petals obovate-spatulate, 3 mm. long.

TYPE LOCALITY: San Bernardino County, California.
DISTRIBUTION: Banks of streams, in the mountains of southern California.

10. **Therophon Richardsoni** (Hook.) Wheelock, Bull. Torrey Club **23**: 70. 1896.

Saxifraga Nelsoniana H. & A. Bot. Beech. Voy. 124. 1832. Not *S. Nelsoniana* D. Don. 1822.
Saxifraga Richardsoni Hook. Fl. Bor. Am. **1**: 247. 1832.
Hemieva Richardsoni Raf. Fl. Tell. **2**: 70. 1836.
Boykinia Richardsoni A. Gray, Bot. Calif. **1**: 196. 1876.

Low; stem glandular-pubescent, 2–3 dm. high; basal leaves long-petioled; blades reniform or rounded-cordate, with shallow round lobes, and glandularly crenate-dentate, glandular-pubescent on the margin and veins beneath; stem-leaves few, the lower similar to the basal ones, the upper rounded or cuneate, sessile; base of the petioles dilated; inflorescence a congested spike-like panicle; bracts lanceolate, as well as the pedicels

glandular-pubescent; hypanthium campanulate, glandular; sepals ovate, acuminate; petals obovate-elliptic, short-clawed, acute, nervose, about twice as long as the sepals.

TYPE LOCALITY: Arctic seashore between the Mackenzie and Coppermine rivers.
DISTRIBUTION: Arctic coast of British America and Alaska; also eastern Siberia.
ILLUSTRATION: H. & A. Bot. Beech. Voy. *pl. 29.*

20. **TELESONIX** Raf. Fl. Tell. 2: 69. 1836.

Low glandular-pubescent perennials with thick scaly rootstocks. Leaf-blades reniform, deeply and doubly crenate. Flowers in a contracted, leafy, somewhat secund panicle. Hypanthium turbinate-campanulate, adnate to the lower half of the ovary. Sepals 5, ovate-lanceolate. Petals 5, red or purple, with long claws and orbicular or obovate-spatulate blades. Stamens 10; filaments subulate, half as long as the sepals. Ovary 2-celled; styles more or less united. Fruit dehiscent between the beaks, which are not divergent. Seeds numerous.

Type species, *Saxifraga Jamesii* Torr.

Petals twice as long as the sepals; blades almost orbicular; beaks of the pistils united almost to the top. 1. *T. Jamesii.*
Petals equaling or slightly exceeding the sepals; blades obovate-spatulate; beaks of the pistils united halfway up. 2. *T. heucheriformis.*

1. **Telesonix Jamesii** (Torr.) Raf. Fl. Tell. 2: 69. 1836.

Saxifraga Jamesii Torr. Ann. Lyc. N. Y. 2: 204. 1827.
Saxifraga Jamesiana Engler, Monogr. Saxifr. 109. 1872.
Boykinia Jamesii Engler; E. & P. Nat. Pfl. 3[2a]: 51. 1890.
Therofon Jamesii Wheelock, Bull. Torrey Club 23: 70. 1896.

Cespitose, with very thick caudex; stems usually less than 1 dm. high, but rarely 2 dm. high, glandular-pubescent as well as the whole plant; basal leaves long-petioled; blades round-reniform, deeply and doubly crenate, 2–3.5 cm. wide; lower stem-leaves similar, but with shorter petioles; upper ones flabellate-cuneate with winged petioles or subsessile; hypanthium turbinate-campanulate, without the sepals 8 mm. long; sepals ovate-lanceolate, 4–5 mm. long; petals reddish-purple, about twice as long as the sepals, long-clawed, the blades orbicular; styles united to near the top.

TYPE LOCALITY: On the Rocky Mountains (Colorado).
DISTRIBUTION: Among rocks in alpine regions of Colorado.
ILLUSTRATION: Bull. Torrey Club 24: *pl. 305, f. 4.*

2. **Telesonix heucheriformis** Rydb.

Saxifraga Jamesii Hook. Fl. Bor. Am. 1: 247. 1832. Not *S. Jamesii* Torr.
Therofon heucheriforme Rydb. Bull. Torrey Club 24: 247. 1897.

Cespitose perennial, closely resembling the preceding in habit, but usually taller, 1–2 dm. high; hypanthium usually smaller, 6–7 mm. long, more hirsute; petals dark-violet, with shorter claw, scarcely exceeding the sepals, the blades narrower, obovate-spatulate; upper half of styles distinct.

TYPE LOCALITY: Bridger Mountains, Montana.
DISTRIBUTION: Rocky mountain sides, from Alberta and British Columbia to the Black Hills of South Dakota and Wyoming.
ILLUSTRATIONS: Hook. Fl. Bor. Am. *pl. 84;* Bull. Torrey Club 24: *pl. 305, f. 3.*

21. **SAXIFRAGA** (Tourn.) L. Sp. Pl. 398. 1753.

Miscopetalum Haw. Syn. Pl. Succ. 323. 1812.
Lobaria Haw. Saxifr. Enum. 20. 1821.

Perennial caulescent herbs, with the flowering stems arising from the small rootstock and with no caudex developed. Leaves alternate, not crowded, but sometimes tufted at the base of the plants; blades more or less 3-lobed, or in diminutive plants nearly entire, narrowed or cordate at the base, mostly petioled. Flowers solitary or in terminal cymes. Hypanthium turbinate or campanulate, longer than the calyx, at least at maturity. Sepals 5, erect, usually with a terminal gland. Corolla white, regular. Petals 5, somewhat narrowed at the base but usually clawless. Stamens 10; filaments subulate. Ovary about half-inferior, the carpels united to above the middle. Follicles partly included in the

hypanthium, well united, erect except the more or less spreading tips. Seeds longitudinally striate or ribbed.

Type species, *Saxifraga granulata* L.

Sepals acuminate or acute. 1. *S. Nuttallii.*
Sepals obtuse.
  Flowers normal, none of them represented by clusters of bulblets.
    Petals oval; inflorescence rather congested and leafy-bracted. 2. *S. bracteata.*
    Petals oblong or cuneate; inflorescence neither congested nor leafy-bracted.
      Petals 2.5–4 mm. long; sepals ovate.
        Petals not abruptly narrowed into claws; leaf-blades thick, the lower ones mainly 3-lobed. 3. *S. rivularis.*
        Petals abruptly narrowed into claws; leaf-blades thin, the lower ones 5–7-lobed. 4. *S. debilis.*
      Petals 7.5–11 mm. long; sepals oblong. 5. *S. radiata.*
  Flowers below the terminal one replaced by clusters of bulblets.
    Lobes of the stem-leaves linear to triangular-lanceolate; petals cuneate. 6. *S. cernua.*
    Lobes of the stem-leaves broad and rounded, as broad as long or broader; petals fiddle-shaped. 7. *S. simulata.*

1. **Saxifraga Nuttallii** Small, Bull. Torrey Club **23**: 368. 1896.

Saxifraga elegans Nutt.; T. & G. Fl. N. Am. **1**: 573. 1840. Not *S. elegans* Sternb. 1831.

Stems 4.5–38 cm. tall, glabrous or nearly so, paniculate above, few–several-flowered; leaf-blades oval to oblong, many shallowly 3-lobed near the apex, those on the lower part of the stem distinctly petioled; pedicels filiform; hypanthium 2.5–3 mm. long at maturity, essentially glabrous; sepals nearly deltoid, 1–2 mm. long, acuminate or acute; petals oblong, 4–5 mm. long, somewhat abruptly narrowed at the base, but clawless; follicles 4.5–5 mm. long.

TYPE LOCALITY: On moist rocks by springs, on the banks of the Oregon (Columbia) below and near the Willamette.
DISTRIBUTION: Oregon.

2. **Saxifraga bracteata** D. Don, Trans. Linn. Soc. **13**: 367. 1822.

Stems 5–19 cm. tall, sometimes tufted, somewhat pubescent; leaf-blades reniform or orbicular in outline, 13–27 mm. broad, mostly 5–7-lobed, the lobes ovate, sometimes quite broad, the petioles of the lower leaves much longer than the blades; flowers in rather congested and leafy-bracted cymes; hypanthium 3.5–5 mm. long at maturity; sepals broadly ovate, 3–4.5 mm. long, obtuse; petals oval, 5–6 mm. long, clawless; follicles 7–8.5 mm. long, much surpassing the calyx.

TYPE LOCALITY: Eastern Siberia.
DISTRIBUTION: Islands and mainland, Bering Sea region.

3. **Saxifraga rivularis** L. Sp. Pl. 404. 1753.

Saxifraga petiolaris R. Br. in Ross, Voy. ed. 2. **2**: 192. 1819.
Lobaria rivularis Haw. Saxifr. Enum. 19. 1821.
Saxifraga hyperborea R. Br. Chlor. Melv. 16. 1823.
?*Saxifraga laurentiana* Seringe, in DC. Prodr. **4**: 35. 1830.
Saxifraga rivularis hyperborea Engler, Monogr. Saxifr. 105. 1872.
Saxifraga rivularis purpurascens Lange, Consp. Fl. Groenl. 62. 1880.

Stems 3–8.5 cm. tall, tufted, glabrous or finely glandular-pubescent; leaf-blades reniform in outline, 3.5–12 mm. broad, thick, mainly 3-lobed, those of the stem-leaves sometimes entire, those of the basal and lower cauline long-petioled; hypanthium 2–3.5 mm. long at maturity; sepals ovate, 1.5–2.5 mm. long, obtuse; petals oblong, sometimes broadly so, or oblong-cuneate, 3–5 mm. long, clawless; follicles 6–6.5 mm. long.

TYPE LOCALITY: Lapland.
DISTRIBUTION: Circumboreal, ranging southward in North America to the White Mountains, and in the Rocky Mountains to Montana.
ILLUSTRATIONS: L. Fl. Lapp. *pl. 2, f. 7*; Fl. Dan. 1: *pl. 118*; Svensk Bot. *pl. 729*; Curt. Fl. Lond. **5**: *pl. 213*; Engl. Bot. *pl. 2275*; Britt. & Brown, Ill. Fl. *f. 1829.*

4. **Saxifraga debilis** Engelm. Proc. Acad. Phila. **1863**: 62. 1863.

Saxifraga cernua debilis Engler, Monogr. Saxifr. 107. 1872.

Stems 3–14.5 cm. tall, loosely tufted, glabrous or nearly so; leaf-blades suborbicular or reniform in outline, 6–17 mm. wide, thin, mainly 5-lobed, those of the stem-leaves shal-

lowly lobed or entire, those of the basal and lower cauline long-petioled, sometimes 7-lobed; hypanthium 3–4.5 mm. long at maturity; sepals ovate, 1.5–2 mm. long, obtuse; petals cuneate to oblong, 3–7 mm. long, abruptly clawed at the base; follicles 6–7.5 mm. long.

TYPE LOCALITY: Rocky Mountains, Colorado.
DISTRIBUTION: Montana to Wyoming, Colorado and Utah.

5. **Saxifraga radiata** Small.

Saxifraga exilis Stephan; Sternb. 1st Suppl. Rev. Saxifr. 8. 1822. Not *S. exilis* Poll. 1816.
Saxifraga elegans Sternb. Suppl. Rev. Saxifr. 2: 34. 1831. Not *S. elegans* Zeyh. 1824.
Saxifraga sibirica Hook. Fl. Bor. Am. 1: 246. 1832. Not *S. sibirica* L. 1753.

Stems 18–28 cm. tall, sparingly glandular-pubescent, somewhat gregarious; leaf-blades reniform or orbicular-reniform in outline, 11–22 mm. wide, those of the basal and lower cauline leaves long-petioled, 5–7-lobed, those of the upper cauline 3–5-lobed; flowers 2–7 together or solitary, none replaced by bulblets; hypanthium 3–3.5 mm. long at maturity; sepals oblong, 2–2.5 mm. long; petals oblong, 7–8 mm. long, clawless; follicles 7–8 mm. long.

TYPE LOCALITY: Siberia.
DISTRIBUTION: Islands and mainland about Bering Sea.

6. **Saxifraga cernua** L. Sp. Pl. 403. 1753.

Lobaria cernua Haw. Saxifr. Enum. 20. 1821.
?*Saxifraga cernua pauciflora* Sternb. Suppl. Rev. Saxifr. 2: 30. 1831.
?*Saxifraga Cymbalaria* T. & G. Fl. N. Am. 1: 574. 1840.

Stems 8–19 cm. tall, somewhat glandular-pubescent, slightly gregarious; leaf-blades reniform in outline, 9–23 mm. wide, those of the basal and lower cauline leaves long-petioled, prominently 5–7-lobed, the lobes linear to triangular-lanceolate, the upper stem-leaves with 3–5-lobed blades; flowers represented by clusters of bulblets except a single terminal one; hypanthium 3.5–5 mm. long at maturity; sepals oblong to oblong-lanceolate, 3–4.5 mm. long; petals cuneate, 6–8 mm. long, clawless; follicles mainly undeveloped.

TYPE LOCALITY: Lapland.
DISTRIBUTION: Circumpolar and alpine, extending southward to Labrador, and in the Rocky Mountains to Colorado.
ILLUSTRATIONS: L. Fl. Lapp. *pl. 2, f. 4;* Fl. Dan. 1: *pl. 22;* Svensk Bot. *pl. 730;* Engl. Bot. *pl. 664;* Sternb. Rev. *pl. 12;* Britt. & Brown, Ill. Fl. *f. 1826.*

7. **Saxifraga simulata** Small, sp. nov.

Stems 9–22 cm. tall, sparingly glandular-pubescent, gregarious; leaf-blades reniform or orbicular-reniform in outline, 8–21 mm. wide, those of the basal and lower cauline leaves long-petioled, shallowly and broadly 5–7-lobed, the lobes much broader than long, the upper stem-leaves with 3–5-lobed blades; flowers represented by clusters of bulblets, except the terminal one; hypanthium 1.5 mm. long during anthesis; sepals oblong-ovate, 3–3.5 mm. long; petals fiddle-shaped, 6–7 mm. long, clawless; follicles not seen.

Type collected at Sylvan Lake and Harney Peak, Black Hills, South Dakota, July 21, 1892, by P. A. Rydberg, *no. 681.*
DISTRIBUTION: Black Hills, South Dakota to Colorado.

DOUBTFUL AND EXCLUDED SPECIES

Saxifraga androsacea Pursh, Fl. Am. Sept. 310. 1814. (Not *S. androsacea* L.) Not identified.

Saxifraga caroliniana Schleich. Cat. 63. 1821. Nomen nudum.

Saxifraga groenlandica Pursh, Fl. Am. Sept. 312. 1814. (Not *S. groenlandica* L.) Not identified.

Saxifraga nutans D. Don, Trans. Linn. Soc. 13: 368. 1822. A species of *Romanzoffia.*

Saxifraga pectinata Pursh, Fl. Am. Sept. 312. 1814. = *Lutkea pectinata* (Pursh) Kuntze.

Saxifraga sibirica Pursh, Fl. Am. Sept. 312. 1814. (Not *S. sibirica* L.) = *Saxifraga cernua* L.?

Saxifraga tridactylites L. Referred to British America by Engler, Monogr. Saxifr. 84. 1872.

Saxifraga vernalis Hook. Fl. Bor. Am. 1: 248. 1832. (Not *S. vernalis* Willd.) A mixture of several American species of *Micranthes*.

Two unpublished species of *Saxifraga* are said to occur in Mexico. According to Hemsley (Biol. Cent. Am. Bot. 1: 381) the specimens were preserved in the herbarium of the Paris Museum; but a recent search has failed to reveal them.

22. **MUSCARIA** Haw. Saxifr. Enum. 36. 1821.

Ponista Raf. Fl. Tell. 2: 65. 1836.

Perennial caulescent matted herbs, with copiously leafy caudices and sparingly leafy flower-stalks. Leaves alternate, approximate and imbricated on the caudices; blades 3-lobed, or rarely 5–7-lobed, narrowed at the base. Flowers solitary or few in terminal cymes. Hypanthium turbinate or campanulate, longer than the calyx, at least at maturity. Sepals 5, erect. Corolla white, regular. Petals 5, relatively broad, clawless. Stamens 10; filaments subulate. Ovary about one half inferior, the carpels united to above the middle. Follicles mostly included in the hypanthium, erect, the tips sometimes slightly spreading. Seeds longitudinally striate or ridged.

Type species, *Saxifraga muscoides* Wulf.

Leaves of the caudex with entire or slightly 3-toothed blades. 1. *M. adscendens.*
Leaves of the caudex with 3-cleft or prominently 3-lobed blades.
  Petals less than 2 mm. long. 2. *M. micropetala.*
  Petals over 2 mm. long.
    Mature hypanthium turbinate, campanulate or hemispheric.
      Petals 2.5–3.5 mm. long. 3. *M. delicatula.*
      Petals 4.5–7 mm. long.
        Mature hypanthium turbinate or campanulate at the base, not constricted at the top.
          Sepals oblong-lanceolate to triangular-lanceolate; hypanthium turbinate during anthesis. 4. *M. monticola.*
          Sepals broadly ovate to half-orbicular; hypanthium campanulate during anthesis. 5. *M. caespitosa.*
        Mature hypanthium hemispheric at the base, slightly constricted at the top. 6. *M. emarginata.*
    Mature hypanthium ovoid. 7. *M. sileniflora.*

1. **Muscaria adscendens** (L.) Small.

Saxifraga adscendens L. Sp. Pl. 405. 1753.
Saxifraga petraea Hook. Fl. Bor. Am. 1: 245. 1832. Not *S. petraea* L. 1753.
Ponista oregonensis Raf. Fl. Tell. 2: 66. 1836.

Plants 2.5–11 cm. tall, somewhat glandular-pubescent; leaf-blades 3–8 mm. long, mainly cuneate to spatulate, 3-toothed or those on the flower-stalks sometimes entire; flower-stalks sparingly branched above or throughout; sepals ovate or oblong-ovate, 1.5–2.5 mm. long, acute or obtuse; petals cuneate to oblong-cuneate, 3–3.5 mm. long, the claws slender or stout; follicles 3.5–5.5 mm. long.

TYPE LOCALITY: Pyrenees.
DISTRIBUTION: Rocky Mountains, southern British America to Colorado and Utah; also in Europe.

2. **Muscaria micropetala** Small, sp. nov.

Plants 2–6 cm. tall, rather copiously glandular-pubescent; leaves compactly crowded on the caudices, the blades 5–9 mm. long, 3-lobed at the apex, the lobes linear or oblong-linear; flower-stalks relatively stout, 1–3-flowered, each bearing 2 or 3 leaves; hypanthium about 3 mm. long at maturity; sepals broadly ovate, obtuse or acutish, about 2 mm. long; petals oval or oval-obovate, about 1.5 mm. long, clawless; follicles 5–6 mm. long.

Type collected at the head of Buffalo Creek, Teton Forest Reserve, Wyoming, August, 1897, by Frank Tweedy, *no. 118*.
DISTRIBUTION: Wyoming and Utah.

3. **Muscaria delicatula** Small, sp. nov.

Plants 1–3.5 cm. tall, sparingly glandular-pubescent; leaves crowded on the caudices, sometimes rather compactly so, the blades 5–16 mm. long, 3-lobed at the apex, the lobes lan-

ceolate to oblong or linear, the petiole-like bases sometimes elongated; flower-stalks slender, 1- or 2-flowered, each bearing 1 or 2 leaves; hypanthium 2–2.5 mm. long at maturity, turbinate at the base; sepals oblong to oblong-lanceolate, 2–2.5 mm. long, obtuse; petals oblong, sometimes rather broadly so, 2.5–4 mm. long, clawless; follicles 3–3.5 mm. long.

Type collected on Gray's Peak, Colorado, August 23, 1895, by P. A. Rydberg.
DISTRIBUTION: Alberta to Montana, Colorado and Utah.

4. **Muscaria monticola** Small, sp. nov.

Saxifraga exarata Hook. Fl. Bor. Am. 1: 244. 1832. Not *S. exarata* Vill. 1779.

Plants 4.5–16 cm. tall, finely glandular-pubescent; leaves crowded on the caudices, the blades 7–18 mm. long, 3-lobed at the apex, the lobes linear to oblong-ovate, acute; flower-stalks slender, typically 3–5-flowered, sometimes 1-flowered, each bearing 1–3 leaves; hypanthium 3.5–4 mm. long at maturity, turbinate at the base; sepals oblong-lanceolate to triangular-lanceolate, 2–2.5 mm. long, mostly acute; petals obovate, 4–5 mm. long, clawless; follicles about 5 mm. long.

Type collected near Banff, Alberta, June 23, 1899, by W. C. McCalla, *no. 2288*.
DISTRIBUTION: Rocky Mountains, British America to Montana.

5. **Muscaria caespitosa** (L.) Haw. Saxifr. Enum. 37. 1821.

Saxifraga caespitosa L. Sp. Pl. 404. 1753.
?*Saxifraga groenlandica* L. Sp. Pl. ed. 2. 578. 1762.
Saxifraga uniflora R. Br. Chlor. Melv. 16. 1823.
Saxifraga pubescens Sternb. Linnaea 6: 556. 1831.
Saxifraga caespitosa uniflora Hook. Fl. Bor. Am. 1: 244. 1832.
?*Saxifraga sileniflora minor* Presl; T. & G. Fl. N. Am. 1: 566. 1840.
Saxifraga decipiens Sternbergii Engler, Monogr. Saxifr. 188. 1872.
Saxifraga decipiens caespitosa Engler, Monogr. Saxifr. 190. 1872.
Saxifraga decipiens groenlandica Lange, Consp. Fl. Groenl. 62. 1880.
Saxifraga decipiens uniflora Lange, Consp. Fl. Groenl. 62. 1880.
Saxifraga caespitosa minima Blankinship, Mont. Agr. Coll. Sci. Stud. 1: 64. 1905.

Plants 5–16 cm. tall, glandular-pubescent; leaves crowded on the caudices, sometimes densely so, but rarely compactly crowded, the blades 8–17 mm. long, 3-lobed at the apex, the lobes lanceolate or linear; flower-stalks stoutish, 3–few-flowered, each bearing 2 or 3 leaves; hypanthium 3.5–4.5 mm. long at maturity, turbinate at the base; sepals ovate to ovate-lanceolate, 2–3.5 mm. long, obtuse or acutish; petals narrowly obovate or oblong-obovate, 5–7 mm. long, rounded at the apex; follicles 5–7 mm. long.

TYPE LOCALITY: Lapland.
DISTRIBUTION: Greenland, Labrador and the Rocky Mountain region of the northern United States and British America to the Pacific Coast; also in Europe and Asia.
ILLUSTRATIONS: Scop. Fl. Carn. 1: *pl. 14*; Fl. Dan. 1: *pl. 71* and 8: *pl. 1388*; Engl. Bot. *pl. 794*; Svensk Bot. *pl. 731*; Sternb. Rev. Saxifr. *pl. 11*; Britt. & Brown, Ill. Fl. *f. 1830*.

6. **Muscaria emarginata** Small, sp. nov.

Plants 4–13 cm. tall, sparingly glandular-pubescent; leaves more or less densely crowded on the caudices, the blades 7–21 mm. long, 3-lobed at the apex, the lobes ovate, oblong or linear, the petiole-like basal portion often slender; flower-stalks relatively slender, 2–6-flowered, or sometimes 1-flowered, bearing several leaves; hypanthium 3.5–4 mm. long at maturity, hemispheric at the base; sepals ovate or oblong-ovate, 2.5–3 mm. long, obtuse; petals oblong to oval, 4.5–7 mm. long, notched or retuse at the apex; follicles 5–6 mm. long.

Type collected on the Olympic Mountains, Washington, June, 1900, by A. D. E. Elmer, *no. 2649*.
DISTRIBUTION: British Columbia, Washington and Oregon.

7. **Muscaria sileniflora** (Sternb.) Small.

Saxifraga sileniflora Sternb. Linnaea 6: 557. 1831.
Saxifraga caespitosa uniflora H. & A. Bot. Beech. Voy. 123. 1832. Not *Saxifraga uniflora* R. Br. 1824.
Saxifraga sileniflora uniflora Hook.; T. & G. Fl. N. Am. 1: 266. 1840.

Plants 4.5–15 cm. tall, glandular-pubescent; leaves densely crowded on the caudices, 8–19 mm. long, the blades 3-lobed at the apex, the lobes oblong or linear-lanceolate, the basal portions of the leaves often elongated; flower-stalks relatively stout, 1-flowered, each

bearing 2–4 leaves; hypanthium 4–5.5 mm. long at maturity, turbinate at the base; sepals ovate, 2.5–3 mm. long, obtuse; petals broadly obovate, 5.5–6.5 mm. long, clawless; follicles 9–11 mm. long.

TYPE LOCALITY: Unalaska.
DISTRIBUTION: Coast of Alaska, adjacent islands and northeastern Asia.

23. **CHONDROSEA** Haw. Saxifr. Enum. 10. 1821.

Evaiezoa Raf. Fl. Tell. **2**: 70. 1836.

Perennial caulescent herbs, with a densely leafy short caudex and offsets, and sparingly leafy flower-stalks. Leaves alternate; blades serrate, each tooth terminating in an encrusted pore. Flowers in terminal compound cymes. Hypanthium turbinate to campanulate, at maturity longer than the calyx. Sepals 5, erect. Corolla white, regular. Petals 5, clawless. Stamens 10; filaments lanceolate or lanceolate-subulate. Ovary about half-inferior, the carpels united to above the middle. Follicles united up to the more or less spreading tips, mostly included in the hypanthium. Seeds prominently ribbed, granular.

Type species, *Chondrosea pyramidalis* Haw.

1. **Chondrosea Aizoon** (Jacq.) Haw. Saxifr. Enum. 11. 1821.

Saxifraga Aizoon Jacq. Fl. Austr. **5**: 18. 1778.
Saxifraga Aizoon brevifolia Engler, Monogr. Saxifr. 244. 1872.
Saxifraga Aizoon robusta Engler, Monogr. Saxifr. 244. 1872.

Caudex short, bearing a dense rosette of leaves, more or less proliferous; leaf-blades linear-oblong to spatulate, 1.5–4 cm. long, serrate with white-encrusted teeth, sessile; flower-stalks erect, 1–4 dm. tall, with few remote leaves whose blades are more abruptly broadened than those on the caudex; panicle with remote elongated lower peduncles at maturity; sepals ovate, 1.5–2 mm. long; petals oval, oval-obovate or oval-oblong, 3.5–4 mm. long, sessile; filaments lanceolate; fruit 4–5 mm. long, the follicles turgid.

TYPE LOCALITY: Mountains of Austria.
DISTRIBUTION: Arctic America from Labrador to Saskatchewan, Nova Scotia and Vermont; also in Europe and Asia.
ILLUSTRATIONS: Jacq. Fl. Austr. *pl. 438;* Sternb. Rev. Saxifr. *pl. 3a;* Britt. & Brown, Ill. Fl. *f. 1829.*

24. **SAXIFRAGOPSIS** Small, Bull. Torrey Club **23**: 19. 1896.

Perennial caulescent herbs, with woody rootstocks and prostrate caudices. Leaves alternate, crowded on the caudex, remote on the flower-stalk, and there passing into the bracts of the inflorescence, 1-foliolate; the petioles slender, each with a persistent scarious ribbed dilated base; leaflet with a cuneate blade, toothed at the apex or above the middle. Flowers numerous, the cymes in a thyrsoid panicle, with small ciliate bracts. Hypanthium campanulate, about as long as the calyx. Sepals 5, becoming reflexed. Corolla white, regular. Petals 5, of a spatulate type, reflexed at maturity. Filaments subulate, winged. Ovary partially adnate to the hypanthium, the carpels united to below the middle. Follicles erect, the subulate tips not diverging. Seeds essentially smooth.

Type species, *Saxifraga fragarioides* Greene.

1. **Saxifragopsis fragarioides** (Greene) Small, Bull. Torrey Club **23**: 20. 1896.

Saxifraga fragarioides Greene, Bull. Torrey Club **8**: 121. 1881.

Rootstock and caudex clothed with the scarious leaf-bases, branched; leaves numerous, the petioles slender, 1.5–6 cm. long, channeled above, widely dilated at the base; leaflet solitary, the blade thin, cuneate, 1.5–4.5 cm. long, flabellately veined, coarsely toothed at the apex or above the middle; flower-stalks straw-like, usually several together, 1–3 dm. tall, sparingly pubescent, bearing few leaves; panicle at length open, the cymes slender-peduncled; sepals ovate to ovate-lanceolate, 1.5–2 mm. long, ciliate, reflexed; petals spatulate, acute or apiculate, 2.5–3 mm. long, persistent and reflexed; filaments winged at base; fruit conic, 4.5–6 mm. long, the follicles slender-beaked.

TYPE LOCALITY: High mountains west of Mt. Shasta, California.
DISTRIBUTION: Northern California and southern Oregon.
ILLUSTRATION: Bull. Torrey Club **23**: *pl. 257.*

25. MICRANTHES Haw. Syn. Pl. Succ. 320. 1812.

Robertsonia Haw. Syn. Pl. Succ. 321. 1812.
Dermasea Haw. Saxifr. Enum. 8. 1821.
Aulaxis Haw. Saxifr. Enum. 46. 1821.
Steiranisia Raf. Fl. Tell. **2**: 68. 1836.

Perennial acaulescent herbs, with very short caudices and solitary or tufted scapes, sometimes bulblet-bearing at the base. Leaves basal; blades fleshy, entire or toothed, ovate to flabellate and with petiole-like bases or rarely suborbicular and cordate at the base and with long petioles. Flowers in terminal cymes disposed in narrow or broad panicles. Hypanthium rather flat, shorter than the calyx. Sepals 5, erect or reflexed. Corolla white, essentially regular. Petals 5, clawless or rarely with distinct claws. Stamens 10; filaments subulate or clavate. Ovary slightly inferior, the carpels partially united, often only at the base. Follicles seated in the hypanthium, spreading or with spreading tips. Seeds wrinkled or granular.

Type species, *Micranthes semipubescens* Haw.

1. Filaments subulate or filiform-subulate, or sometimes narrowly linear.
   a. Cymules compact or closely corymb-like at maturity.
      Cymules wholly or mainly aggregated into a head, 1 or 2 lower ones sometimes remote or peduncled; or if all the cymules are peduncled the sepals surpass the petals.
         Petals shorter than the sepals or about equaling them, or wanting.
            Corolla present.
               Lower cymules sessile; petals about equaling the sepals.
                  Sepals glandular-puberulent; petals 1–1.5 mm. long; lower bracts shorter than the cymules. 1. *M. Rydbergii.*
                  Sepals glandular-hirsute; petals 3–3.5 mm. long; lower bracts longer than the cymules. 2. *M. hieracifolia.*
               Lower cymules peduncled; petals shorter than the sepals.
                  Petals obovate to oval or orbicular-oval.
                     Leaf-blades coarsely crenate. 3. *M. crenatifolia.*
                     Leaf-blades entire or glandular-denticulate.
                        Scape and peduncles thinly arachnoid-pubescent as well as glandular; petals oval or orbicular-oval. 4. *M. nidifica.*
                        Scape and peduncles merely glandular-pubescent; petals obovate. 5. *M. plantaginea.*
                  Petals oblong to cuneate. 6. *M. columbiana.*
            Corolla wanting. 7. *M. apetala.*
         Petals longer than the sepals.
            Peduncles wholly glabrous. 8. *M. aprica.*
            Peduncles pubescent.
               Primary bracts of the inflorescence narrow, green. 9. *M. rhomboidea.*
               Primary bracts of the inflorescence broad, purple or red. 10. *M. nivalis.*
      Cymules in narrow pyramidal or corymb-like panicles.
         Corolla present.
            Petals white.
               Leaves with blades narrowed into petiole-like bases.
                  Sepals not reflexed at maturity.
                     Leaf-blades crenate.
                        Sepals sparingly ciliate; petals markedly clawed; peduncles and pedicels villous. 11. *M. tenuis.*
                        Sepals not ciliate; petals with broad claw-like bases; peduncles and pedicels glabrous or nearly so. 12. *M. texana.*
                     Leaf-blades entire or glandular-denticulate. 13. *M. fragosa.*
                  Sepals reflexed at maturity.
                     Petals clawed.
                        Leaf-blades crenate; petals rounded at the apex. 14. *M. Greenei.*
                        Leaf-blades glandular-denticulate; petals 2-toothed at the apex. 15. *M. bidens.*
                     Petals clawless.
                        Petals obovate to oval-obovate, obtuse or notched at the apex, narrowed at the base; follicles 2–2.5 mm. high. 16. *M. integrifolia.*
                        Petals ovate to elliptic-ovate, acute or acutish at the apex, broad at the base; follicles 1–1.5 mm. high. 17. *M. montana.*
               Leaves without petiole-like bases.
                  Panicle wide; peduncles of the lower cymules elongated.
                     Petals 2–2.5 mm. long. 18. *M. Sierrae.*
                     Petals 3–4 mm. long.

Petals with claw-like bases; Rocky Mountain plant. 19. *M. arnoglossa.*
Petals without claw-like bases; Pacific slope plant. 20. *M. oregana.*
Panicle narrow; peduncles permanently very short. 21. *M. brachypus.*
Petals greenish.
Petals mainly broadest above the middle; follicles short-tipped. 22. *M. montanensis.*
Petals mainly broadest below the middle; follicles long-tipped. 23. *M. pennsylvanica.*
Corolla wanting or obsolete. 24. *M. subapetala.*
b. Cymules open and often raceme-like at maturity.
Corolla wanting. 25. *M. napensis.*
Corolla present.
Hypanthium flattish or spreading-turbinate.
Petals wholly white, destitute of yellow spots.
Petals about as broad as long, rounded at the base, sessile or sometimes with very short claws.
Leaf-blades green and nearly glabrous or sparingly pubescent beneath; petals sessile. 26. *M. californica.*
Leaf-blades red-tomentose beneath; petals short-clawed. 27. *M. rufidula.*
Petals spatulate, cuneate or oblong, narrowed at the base.
Petals oblong or elliptic.
Leaf-blades of a cuneate type; sepals reflexed at maturity; petals 2.5–3 mm. long. 28. *M. Howellii.*
Leaf-blades of an ovate, oval or oblong type; sepals not reflexed; petals 4–5.5 mm. long. 29. *M. virginiensis.*
Petals spatulate or obovate-cuneate, or cuneate at the base.
Leaf-blades as broad as long or broader. 30. *M. parvifolia.*
Leaf-blades manifestly longer than broad.
Petals oval and cuneate at the base; leaf-blades narrowed at the base. 31. *M. fallax.*
Petals spatulate, sometimes broadly so; leaf-blades mainly truncate or subcordate at the base. 32. *M. claytoniaefolia.*
Petals bimaculate, the 2 yellow spots mainly below the middle of the blade.
Petals lanceolate to oblong-lanceolate, 4–4.5 mm. long; follicles 4.5 mm. long. 33. *M. tennesseensis.*
Petals elliptic to oblong, 2.5–3 mm. long; follicles 2.5–3 mm. long. 34. *M. Careyana.*
Hypanthium campanulate, longer than the sepals. 35. *M. eriophora.*
2. Filaments clavate or spatulate.
a. Leaf-blades elongated. 36. *M. micranthidifolia.*
b. Leaf-blades about as broad as long, flabellate to ovate or orbicular.
* Leaf-blades flabellate.
Cymes panicle-like, the main axis prolonged, the branches relatively long. 37. *M. Lyallii.*
Cymes corymb-like, the main axis not prolonged, the branches short.
Peduncles glabrous or nearly so; petals about 2 mm. long, each with an elliptic or oblong blade and a slender claw ½ as long as the blade. 38. *M. davurica.*
Peduncles glandular-villous; petals about 4 mm. long, each with an ovate or orbicular-ovate blade narrowed into a short claw-like base. 39. *M. flabellifolia.*
** Leaf-blades ovate, oval, broadly oblong or orbicular.
Leaf-blades narrowed at the base, neither cordate nor of an orbicular type.
Petals wholly white, not bimaculate.
Flowers in a dense terminal head.
Petals narrowly oval, short-clawed, rounded at the apex; species of Greenland. 40. *M. Kumlienii.*
Petals suborbicular or broadly oval, clawless, notched at the apex; species of Arizona. 41. *M. franciscana.*
Flowers in corymbose or paniculate cymules.
Petals oblong or oval, varying to ovate or obovate.
Petals markedly longer than the sepals; leaf-blades glabrous above or essentially so.
Cymules permanently compact.
Petals rounded at the apex; species of the northern Rocky Mountains. 42. *M. occidentalis.*
Petals notched at the apex; species of the northwest. 43. *M. Allenii.*
Cymules lax and open.
Petals notched at the apex. 44. *M. aequidentata.*
Petals rounded at the apex. 45. *M. saximontana.*
Petals about as long as the sepals or shorter; leaf-blades pubescent. 46. *M. yukonensis.*

Petals orbicular or broader than long. 47. *M. lata.*
Petals bimaculate.
Petals oblong. 48. *M. Marshallii.*
Petals ovate.
Flowers in a terminal corymb; petals sessile. 49. *M. reflexa.*
Flowers in an ample panicle; petals clawed. 50. *M. caroliniana.*
Leaf-blades orbicular or nearly so.
Flowers in narrow spike-like panicles.
Panicle not leafy-bracted; leaf-blades leathery; follicles less than 8 mm. long. 51. *M. spicata.*
Panicle leafy-bracted; leaf-blades membranous; follicles over 8 mm. long. 52. *M. galacifolia.*
Flowers in open or corymb-like panicles or in a terminal head.
Flowers in a compact terminal head. 53. *M. Nelsoniana.*
Flowers in an open or corymb-like panicle.
Petals abruptly or gradually narrowed into claws; petioles glabrous or sparingly pubescent.
Petals with elliptic-oblong or ovate blades, the claws stout. 54. *M. aestivalis.*
Petals with suborbicular or reniform blades, the claws slender. 55. *M. arguta.*
Petals clawless; petioles hirsute. 56. *M. Geum.*

1. **Micranthes Rydbergii** Small.

Saxifraga Rydbergii Small, Mem. N. Y. Bot. Gard. 1: 194. 1900.

Leaves spreading, 2–4 cm. long, the blades oblong to ovate, obtuse, undulate or repand-dentate, glabrous or nearly so, bright-green above, paler beneath, rather abruptly narrowed into broad petiole-like bases; scapes solitary, erect, 5–10 cm. tall, purplish, glandular-puberulent; cymules contracted, sessile or nearly so, forming a narrow raceme-like or spike-like panicle; sepals ovate or triangular-ovate; petals oblong-oval, 1–1.5 mm. long; follicles 3.5–4.5 mm. long, purple, or those of the lower cymules somewhat smaller.

TYPE LOCALITY: Electric Peak, Montana.
DISTRIBUTION: Known only from the type locality.

2. **Micranthes hieracifolia** (Waldst. & Kit.) Haw. Saxifr. Enum. 45. 1821.

Saxifraga hieracifolia Waldst. & Kit.; Willd. Sp. Pl. **2**: 641. 1799.

Leaves spreading, 4–8 cm. long, or shorter on exceptionally small plants; the blades spatulate or oblong-spatulate, obtuse, coarsely shallow-toothed or sometimes merely undulate, bright-green and essentially glabrous above, more or less pubescent beneath, ciliate, gradually narrowed into commonly elongated petiole-like bases; scapes solitary, erect, 7–27 cm. tall, glandular-hirsute; cymules contracted, sessile or nearly so, in a terminal head or forming a spike-like or raceme-like panicle; sepals ovate; petals oblong to oval, 3–3.5 mm. long, about as long as the sepals; follicles 4–5 mm. long, purplish.

TYPE LOCALITY: Carpathian Mountains.
DISTRIBUTION: Arctic and subarctic North America; also in alpine and arctic Europe and Asia.
ILLUSTRATION: Waldst. & Kit. Pl. Rar. Hung. 1: *pl. 18.*

3. **Micranthes crenatifolia** Small, sp. nov.

Leaves spreading, 2–3 cm. long, the blades obovate, cuneate or orbicular-flabellate, coarsely crenate, at least above the middle, glabrous or nearly so on both sides at maturity; scapes relatively stout, erect, solitary, about 15 cm. tall, closely glandular-pubescent with short hairs throughout, but more densely so above; cymules permanently contracted, the lower ones terminating peduncles a few mm. in length; sepals deltoid or ovate-deltoid, obtuse, scarcely if at all ciliate; petals obovate, about 1.5 mm. long, rounded at the apex, shorter than the sepals, narrowed into stout, claw-like bases.

Type collected at Deer Lodge, Montana, May, 1888, by F. W. Traphagen.

4. **Micranthes nidifica** (Greene) Small.

Saxifraga nidifica Greene, Erythea **1**: 222. 1893.

Leaves erect or ascending, 1–4.5 cm. long, the blades ovate to oblong-ovate, entire, glabrous, bright-green above, pale-green or purplish-tinged beneath, abruptly narrowed at

the base, the petiole-like bases shorter than the blades or fully as long, glabrous; scapes relatively slender, erect, solitary, 16–28 cm. tall, pubescent with short glandular hairs and also with arachnoid hairs; cymes permanently contracted, the lower ones peduncled, the peduncles very slender, several times exceeding the subtending bracts; sepals broadly ovate, not ciliate; petals oval to oval-orbicular, about 1.4 mm. long, slightly notched at the apex, without claw-like bases, shorter than the sepals; filaments lanceolate.

TYPE LOCALITY: Above Donner Lake, California.
DISTRIBUTION: California.

5. **Micranthes plantaginea** Small.

Saxifraga plantaginea Small, Bull. Torrey Club **23**: 366. 1896.

Leaves erect or ascending, 3–12 cm. long, the blades oblong, oval or rhombic, entire or remotely and finely toothed, gradually or cuneately narrowed at the base, the petiole-like bases shorter than the blades; scapes relatively stout, erect, solitary, 20–35 cm. tall, finely glandular-hirsute; cymules permanently contracted, the lower ones long-peduncled, the peduncles stout, much exceeding the bracts; sepals broadly ovate; petals obovate, about as broad as long, 1.5–2 mm. long, shorter than the sepals, some of them contracted into short and very broad claw-like bases, rounded at the apex.

TYPE LOCALITY: Spokane, Washington.
DISTRIBUTION: Mountains of eastern Washington.

6. **Micranthes columbiana** (Piper) Small.

Saxifraga columbiana Piper, Bull. Torrey Club **27**: 393. 1900.

Leaves erect or ascending, 2–10 cm. long, the blades oblong to elliptic, varying to ovate, shallowly undulate or denticulate, glabrous or nearly so on both sides, gradually or abruptly narrowed into petiole-like bases which are usually shorter than the blades; scapes erect, relatively slender, 1–3.5 dm. tall, rather copiously glandular-pubescent throughout; cymules permanently contracted, the lower ones terminating slender peduncles; sepals ovate to oblong; petals oblong to cuneate, 1.4–2 mm. long, shorter than the sepals; filaments subulate.

TYPE LOCALITY: Pullman, Washington.
DISTRIBUTION: Washington, Idaho and Oregon.

7. **Micranthes apetala** (Piper) Small.

Saxifraga apetala Piper, Bull. Torrey Club **27**: 393. 1900.

Leaves ascending, 1–3.5 cm. long, the blades spatulate to oblong or ovate, entire or obscurely denticulate, crisped-undulate in age, glabrous or sparingly pubescent on both sides, narrowed into petiole-like bases, which are shorter than the blades; scapes erect, relatively slender, 1–2 dm. tall, rather sparingly glandular-pubescent; cymules mainly aggregated into an oblong or cylindric head; sepals broadly ovate or orbicular-ovate, 1.5–2 mm. long; petals wanting; filaments subulate.

TYPE LOCALITY: Washington.
DISTRIBUTION: Known only from the type locality.

8. **Micranthes aprica** (Greene) Small.

Saxifraga umbellulata Greene, Erythea **1**: 222. 1893. Not *S. umbellulata* Hook. & Thoms. 1857.
Saxifraga aprica Greene, Bull. Torrey Club **23**: 25. 1896.

Leaves ascending or somewhat spreading, 1–5 cm. long, the blades spatulate, oblong or ovate, undulate, sinuate-crenate or shallowly crenulate, bright-green above, usually purplish beneath, cuneately or more abruptly narrowed into petiole-like bases; scapes slender, erect, 4–15 cm. tall, purplish, obscurely and sparingly glandular-pubescent; cymules mainly or wholly aggregated into a terminal head or umbel-like cluster, the peduncles and pedicels very short; sepals ovate, often broadly so; petals obovate or oblong-obovate, 1.5–2 mm. long, longer than the sepals, each narrowed into a claw-like base; filaments subulate; follicles 3.5–4.5 mm. high, purple or purplish, the slender tips spreading.

TYPE LOCALITY: Above Donner Lake, California.
DISTRIBUTION: Mountains of eastern and northern California.

9. **Micranthes rhomboidea** (Greene) Small.

Saxifraga nivalis Hook. Fl. Bor. Am. **1**: 248, in part. 1832. Not *S. nivalis* L.
Saxifraga rhomboidea Greene, Pittonia **3**: 343. 1898.
? *Saxifraga rhomboidea austrina* A. Nelson, Bot. Gaz. **31**: 394. 1901.

Leaves spreading or ascending, 2–6 cm. long, the blades mainly ovoid or rhombic-ovoid, sometimes oblong-ovoid, obtuse, crenate or dentate-serrate, nearly glabrous except the more or less ciliate margins, mainly green, sometimes purplish beneath, abruptly or gradually narrowed into petiole-like bases which are occasionally longer than the blade itself; scapes mainly erect, 8–31 cm. high, green, copiously glandular-pubescent, simple or sparingly paniculate above; cymules aggregated into a terminal head or in several heads terminating the short branches of the inflorescence; bracts subtending the peduncles narrow, green; sepals ovate to triangular, 1.5–3.5 mm. long, barely if at all ciliate, 3-veined; petals white, obovate to oblong-obovate, 2.5–4 mm. long, longer than the sepals, commonly notched at the apex, often contracted into broad claw-like bases; filaments subulate; follicles 3–3.5 mm. high, green or purple-tinged, the stout tips widely spreading.

TYPE LOCALITY: Mountains of Colorado.
DISTRIBUTION: Montana, Wyoming and Colorado.

10. **Micranthes nivalis** (L.) Small.

Saxifraga nivalis L. Sp. Pl. 401. 1753.
Dermasea nivalis Haw. Saxifr. Enum. 9. 1821.

Leaves ascending or spreading, 1.5–4 cm. long, the blades ovate, sometimes broadly so, occasionally some of them cuneate, obtuse, sharply crenate-serrate, purple or red beneath and often pubescent, generally abruptly narrowed into petiole-like bases; scapes erect, solitary or several together, 4–16 cm. tall, purple or purple-tinged, copiously glandular-viscid, especially above; cymules aggregated into a terminal, conspicuously bracted head, or occasionally several heads terminate short branches of the inflorescence; bracts subtending cymules or peduncles broad, purple or red; sepals ovate or deltoid-ovate, 1.5–2 mm. long, obtuse, 3-veined, ciliate; petals white, oblong to elliptic, 2.5–3.5 mm. long, mostly obtuse, narrowed into claw-like bases or scarcely so; filaments subulate; follicles 3.5–4 mm. high, purple or red, the stout tips spreading or recurved-spreading.

TYPE LOCALITY: Mountains of Spitzbergen and Lapland.
DISTRIBUTION: Circumboreal.
ILLUSTRATIONS: L. Fl. Lapp. *pl. 2;* Fl. Dan. **1**: *pl. 28;* Engl. Bot. *pl. 440;* Svensk Bot. *pl. 728;* Britt. & Brown, Ill. Fl. *f. 1834.*

11. **Micranthes tenuis** (Wahl.) Small.

Saxifraga nivalis tenuis Wahl. Fl. Lapp. 113. 1812.
Saxifraga nivalis ramosa Engler, Monogr. Saxifr. 147. 1872.

Leaves spreading, 2–9 cm. long, the blades ovate to oval or orbicular-ovate, obtuse or rounded at the apex, crenate or dentate-crenate, ciliate, abruptly or cuneately narrowed into petiole-like bases which sometimes exceed the blade in length; scapes erect, solitary or several together, 9–21 cm. tall, thinly glandular-pubescent, usually evenly so throughout, generally purple or purple-tinged, terminating in an open cyme; peduncles or branches of the cyme slender, subtended by spatulate bracts; cymules relatively few-flowered, disposed in a terminal corymb-like cyme; sepals ovate to triangular, 2–3 mm. long, obtuse, glandular-ciliate, 3-veined; petals white, oblong, spatulate or elliptic-spatulate, 3–4 mm. long, each narrowed into a claw-like base; filaments subulate, very slender; follicles 5–6 mm. high, green or purple-tinged, the tips ascending or spreading.

TYPE LOCALITY: Lapland.
DISTRIBUTION: Labrador and Greenland. Also Iceland, Scandinavia and Lapland.

12. **Micranthes texana** (Buckl.) Small, Fl. SE. U. S. 501. 1903.

Saxifraga texana Buckl. Proc. Acad. Phila. 1861: 455. 1862.

Leaves spreading, 2–4.5 cm. long, the blades ovate, varying to oblong-ovate or orbicular-ovate, mainly green, nearly glabrous except the sparingly ciliolate margins, sinuate-crenate or merely undulate, rather abruptly narrowed into relatively slender petiole-like

bases; scapes erect, usually solitary, 7–16 cm. tall, glandular-pubescent or somewhat woolly, especially below the middle, green; cymules aggregated into a terminal head, or in heads terminating the branches of the inflorescence; sepals oblong to ovate, 1.5–2 mm. long, obtuse, 3-veined, eciliate; petals white, oval to obovate, 2.5–3 mm. long, narrowed into broad claw-like bases; filaments subulate; follicles about 3 mm. high, often purplish, the stout tips ascending or somewhat spreading.

TYPE LOCALITY: Northeastern Texas.
DISTRIBUTION: Arkansas and Texas.

13. **Micranthes fragosa** (Suksd.) Small.

Saxifraga fragosa Suksd.; Small, Bull. Torrey Club **23**: 363. 1896.

Leaves erect or ascending, 3–9 cm. long, the blades ovate, often rhombic or deltoid-ovate, varying to oblong or orbicular-ovate, obtuse or acute, denticulate or sinuate-denticulate, or entire, glabrous or nearly so, truncate at the base, or abruptly narrowed into relatively slender petiole-like bases which sometimes exceed the blade in length; scapes solitary or tufted, erect or assurgent, 11–32 cm. tall, roughly and rather evenly glandular-pubescent throughout, green; cymules aggregated into more or less compact clusters, terminating the slender branches of the inflorescence; sepals triangular or ovate-triangular, 1–1.5 mm. long, erect, 3-veined, eciliate; petals white, cuneate-obovate to oblong- or oval-obovate, 2–3.5 mm. long, narrowed into rather broad claw-like bases; filaments subulate; follicles about 2 mm. high, green, the stout tips spreading.

TYPE LOCALITY: West Klickitat County, Washington.
DISTRIBUTION: Washington and Oregon.

14. **Micranthes Greenei** Blankinship, Mont. Agr. Coll. Sci. Stud. **1**: 65. 1905.

Leaves spreading or ascending, 2–6 cm. long, the blades ovate to oblong-ovate or oval-oblong, crenate, obtuse at the apex, ciliolate or sometimes almost glabrous, gradually or abruptly narrowed into short petiole-like bases; scapes erect, typically solitary, roughish glandular-pubescent throughout, sometimes more densely so near the base, green or rarely purple-tinged above; cymules aggregated into clusters, terminating the ascending slender branches of the inflorescence; sepals 1–2 mm. long, reflexed, ovate or triangular-ovate, 3-veined; petals white, 2–3 mm. long, the blades ovate, oval or obovate, rounded at the apex, narrowed into slender claws; filaments subulate; follicles 3.5–4.5 mm. high, purple or red, the stout tips spreading at maturity.

TYPE LOCALITY: Mt. Hyalite, Montana.
DISTRIBUTION: Montana to Utah and Nevada.
ILLUSTRATION: Mont. Agr. Coll. Sci. Stud. **1**: 67. *f. A, B.*

15. **Micranthes bidens** Small, sp. nov.

Leaves erect or ascending, 3–7 cm. long, the blades oblong to oval, rounded at the apex, or obtuse, glandular-denticulate, more or less ciliolate, often thinly pubescent above, narrowed into relatively slender petiole-like bases, which are shorter than the blade; scapes erect, typically solitary, generally 30–40 cm. tall, copiously and evenly glandular-villous throughout, paniculate above; cymules aggregated into clusters terminating the very slender branches of the inflorescence; sepals oblong to ovate-oblong, about 1.5 mm. long, eciliate; petals white, 4–4.5 mm. long, the blades oblong or elliptic, 2-toothed at the apex, contracted into claws at the base; filaments subulate; follicles about 3 mm. high, purplish, the tips ultimately spreading.

Type collected at Cedar Hill, Vancouver Island, May 12, 1887, by John Macoun.

16. **Micranthes integrifolia** (Hook.) Small.

Saxifraga integrifolia Hook. Fl. Bor. Am. **1**: 249. 1832.
Saxifraga bracteosa Suksd. Deutsche Bot. Monats. **18**: 27. 1900.
Saxifraga bracteosa angustifolia Suksd. Deutsche Bot. Monats. **18**: 27. 1900.
Saxifraga aphanostyla Suksd. Deutsche Bot. Monats. **18**: 27, as synonym. 1900.

Leaves mainly erect or ascending, 3–7.5 cm. long, the blades ovate, varying to oblong

or oblong-lanceolate, or occasionally some of them orbicular-ovate, entire or glandular-denticulate, glabrous or sparingly pubescent on the upper surface and rarely somewhat ciliolate, gradually or abruptly narrowed into petiole-like bases; scapes solitary or several together, 11–35 cm. tall, more or less glandular-pubescent, sometimes roughish, paniculate above; cymules aggregated into clusters terminating the slender branches of the inflorescence, or wholly aggregated into a terminal head; sepals ovate, sometimes broadly so, 1.5–2 cm. long, eciliate; petals white, obovate to oval-obovate, 2–3 mm. long, clawless; filaments subulate, often broadly so; follicles 2.5–3 mm. high, often purple-tinged, the bodies not depressed, the tips spreading or ultimately recurved.

TYPE LOCALITY: Near the mouth of the Columbia, northwest coast of America.
DISTRIBUTION: British Columbia to California.
ILLUSTRATION: Hook. Fl. Bor. Am. *pl. 86.*

17. **Micranthes montana** Small, sp. nov.

Leaves spreading, 2–3.5 cm. long, the blades ovate to oblong, entire or crenate-undulate, glabrous or nearly so, narrowed into rather long petiole-like bases; scapes erect, usually solitary, 8–21 cm. tall, more densely glandular-pubescent above than below; cymules permanently compact, terminating the rather long spreading or ascending-spreading inflorescence-branches; sepals ovate, about 1.5 mm. long, eciliate; petals white, ovate to elliptic-ovate, 1.8–2.1 mm. long, clawless; filaments subulate; follicles 1–1.5 mm. high, purplish, the bodies depressed, the tips somewhat spreading.

Type collected at Pyramid Peak, California, in the summer of 1903, by Mrs. F. M. Meigs.
DISTRIBUTION: California.

18. **Micranthes Sierrae** (Coville) Heller, Muhlenbergia **2**: 52. 1905.

Saxifraga integrifolia Sierrae Coville, Proc. Biol. Soc. Wash. **7**: 78. 1892.
Saxifraga Sierriae Small, Bull. Torrey Club **23**: 366. 1896.

Leaves erect or ascending, 4–20 cm. long, or sometimes longer, the blades oblong or elliptic to oblong-spatulate, remotely glandular-denticulate, sometimes sparingly pubescent and ciliolate, gradually narrowed to the dilated scarious partly sheathing base; scapes erect, typically solitary, stout, 20–70 cm. tall, thinly glandular-pubescent, paniculate above, sometimes narrowly so; cymules aggregated into clusters terminating the ascending or erect branches of the inflorescence; sepals deltoid to ovate, 1.5–2 mm. long, eciliate; petals white, elliptic to oblong, 2–2.5 mm. long, clawless; filaments subulate; follicles 3.5–4 mm. high, often purple, the stout tips spreading.

TYPE LOCALITY: Headwaters of the Kern River, Tulare County, California.
DISTRIBUTION: Sierra Nevada mountains, California.

19. **Micranthes arnoglossa** Small, sp. nov.

Leaves ascending or spreading, 6–19 cm. long, the blades oblong to elliptic, sometimes narrowly so, remotely glandular-denticulate, ciliolate and sometimes sparingly pubescent, each narrowed to a dilated sheathing base; scapes erect, typically solitary, 30–70 cm. tall, stout, glandular-pubescent, sometimes closely so, rather widely paniculate above; cymules aggregated into clusters terminating the inflorescence-branches; sepals broadly ovate to deltoid, 1.5–3 mm. long, generally eciliate; petals white, mainly oblong to elliptic, 3–3.5 mm. long, with broad claw-like bases; filaments subulate; follicles about 4 mm. high, often purplish, the stout tips spreading or somewhat recurved.

Type collected at Marshall Pass, Colorado, July 19, 1901, by C. F. Baker, *no. 509.*
DISTRIBUTION: Montana and Idaho to Colorado.

20. **Micranthes oregana** (Howell) Small.

Saxifraga oregana Howell, Erythea **3**: 34. 1895.

Leaves erect or ascending, 3–11 cm. long or longer, the blades oblong to elliptic or ovate-elliptic (greatly elongated and broadly linear to linear-spatulate on plants growing in water), crenulate or minutely glandular-denticulate, typically glabrous except the ciliolate margins, each with a short sheathing base; scapes erect, typically solitary, stout, 30–100 cm. tall, rather copiously glandular-pubescent, widely paniculate above; cymules

aggregated into clusters terminating the inflorescence-branches; sepals ovate to half-orbicular, about 2 mm. long, eciliate; petals white, oval to suborbicular, 3.5–4 mm. long, clawless; filaments subulate; follicles 4–5 mm. long, green, the short stout tips spreading.

TYPE LOCALITY: Oregon and Washington.
DISTRIBUTION: Washington to California.

21. **Micranthes brachypus** Small, sp. nov.

Leaves spreading, 6–13 cm. long, the blades oblong to elliptic, remotely glandular-denticulate, glabrous or nearly so, except the ciliolate margins, the sheathing bases short; scapes solitary, 2–4 dm. tall, sparingly glandular-pubescent, narrowly paniculate above; cymules aggregated at the ends of the short inflorescence-branches; sepals ovate, 1.5–2 mm. long, eciliate; petals white, oblong or nearly so, 3–3.5 mm. long, clawless; filaments subulate; follicles 3–4 mm. long, green or purplish, the very short tips spreading.

Type collected at Marlette Lake, Nevada, July 29, 1902, by C. F. Baker, *no. 1395*.
DISTRIBUTION: Colorado to Nevada.

22. **Micranthes montanensis** Small.

Saxifraga montanensis Small, Bull. Torrey Club **23**: 367. 1896.

Leaves erect or ascending, 3.5–14 cm. long, the blades various, often ovoid-oval, narrowly oblong-lanceolate and spatulate on the same plant, entire or glandular-denticulate, often sparingly pubescent, especially about the veins beneath, narrowed to the broad partly sheathing bases; scapes erect, typically solitary, or sometimes 2 or 3 together, stout, 28–60 cm. tall, finely glandular-pubescent throughout, paniculate above; cymules aggregated into clusters terminating the ascending or nearly erect branches of the inflorescence; sepals ovate to triangular-ovate, 1–2 mm. long, 3-veined, eciliate; petals greenish, nearly oblong or elliptic, mainly broadest above the middle, 1–2.5 mm. long, clawless; filaments subulate; follicles about 3 mm. high, green, the short stout tips spreading.

TYPE LOCALITY: Southeastern Montana.
DISTRIBUTION: Montana.

23. **Micranthes pennsylvanica** (L.) Haw. Saxifr. Enum. 45. 1821.

Saxifraga pennsylvanica L. Sp. Pl. 399. 1753.
Saxifraga pennsylvanica minor D. Don, Trans. Linn. Soc. **13**: 384. 1822.
Saxifraga Forbesii Vasey, Am. Entomologist & Botanist **2**: 288. 1870.

Leaves erect or erect-ascending, 5–35 cm. long, the blades narrowly oblong, or elliptic to spatulate, or those of the early leaves relatively shorter and broader, more or less pubescent, sometimes shaggy near the base, ciliate, glandular-denticulate or crenate, often unevenly so, narrowed to the partly sheathing bases; scapes relatively stout, erect, typically solitary, 30–110 cm. tall, paniculate above, thinly and finely glandular-pubescent, with the hairs sometimes longer and more copious near the base; cymules aggregated into clusters on the slender branches of the inflorescence; sepals ovate or triangular-ovate, 1–1.5 mm. long; petals greenish, 1.5–3 mm. long, or rarely longer, broadest below the middle, commonly narrowly lanceolate or oblong-lanceolate, clawless; filaments subulate, sometimes broadly so; follicles 3.5–4.5 mm. high, green, the slender tips spreading.

TYPE LOCALITY: Pennsylvania.
DISTRIBUTION: Maine and Ontario to Minnesota, Virginia and Missouri.
ILLUSTRATION: Britt. & Brown, Ill. Fl. *f. 1831*.

24. **Micranthes subapetala** (E. Nelson) Small.

Saxifraga subapetala E. Nelson, Erythea **7**: 169. 1899.

Leaves erect or ascending, 3–17 cm. long, the blades narrowly oblong to oblong-spatulate, or linear-oblong, the earlier ones relatively shorter and broader, all undulate or remotely glandular-toothed, often sparingly pubescent, ciliolate, gradually narrowed into petiole-like bases which are more or less scarious and sheathing at the base; scapes erect, typically solitary, 28–50 cm. tall, thinly glandular-pubescent, narrowly paniculate above; cymules aggregated into clusters terminating the short branches of the inflorescence, or some of the upper ones almost sessile; sepals ovate, 1–2 mm. long, 3-veined, eciliate; petals wanting

or obsolete; filaments subulate; follicles 3–4 mm. high, green or purple-tinged, the stout tips spreading or ultimately somewhat recurved.

TYPE LOCALITY: Eastern Idaho.
DISTRIBUTION: Montana, Wyoming and Idaho.

25. **Micranthes napensis** Small.

Saxifraga napensis Small, Bull. Torrey Club **25**: 316. 1898.

Leaves ascending or somewhat spreading, 5–12 cm. long, the blades broadly oblong to ovate, often somewhat irregular, undulate and occasionally inconspicuously glandular-denticulate, mostly sparingly pubescent on both sides and ciliolate, narrowed into relatively slender petiole-like bases; scape typically solitary, about 25 cm. tall, loosely branched above, glabrous below, sparingly glandular-pubescent above; cymules few-flowered, open, the pedicels filiform; sepals oblong or ovate-oblong, about 1.5 mm. long, glabrous, reflexed; corolla wanting; filaments subulate, shorter than the sepals; follicles about 3 mm. high, mainly green, the tips widely spreading.

TYPE LOCALITY: Napa Valley, California.
DISTRIBUTION: California.

26. **Micranthes californica** (Greene) Small.

Saxifraga virginiensis Benth. Pl. Hartw. 311. 1848. Not *S. virginiensis* Michx.
Saxifraga californica Greene, Pittonia **1**: 286. 1889.

Leaves spreading or ascending, 3–11 cm. long, the blades mainly oblong to ovate, crenate or merely sinuate-denticulate, more or less pubescent on both sides, ciliolate, paler beneath than above, abruptly or gradually narrowed into petiole-like bases of various lengths; scapes solitary or sparingly tufted, 15–40 cm. tall, glandular-pubescent throughout but often less densely so below, green, or purple near the base, loosely branched above; cymules open, few-flowered, at least relatively so, the pedicels slender; sepals ovate, sometimes ciliolate, reflexed, 1.5–2 mm. long; petals white, oblong to suborbicular, 3.5–5 mm. long, often notched at the apex, mainly rounded at the base; filaments subulate, often as long as the sepals or longer; follicles 3–3.5 mm. high, purple or purple-tinged, the short beaks spreading at maturity.

TYPE LOCALITY: Central parts of California.
DISTRIBUTION: California.

27. **Micranthes rufidula** Small, sp. nov.

Leaves ascending or somewhat spreading, 1–3.5 cm. long, the blades very thick, ovate or oval, finely and rather deeply crenate, bright-green and glabrous or essentially so above, densely red-tomentose beneath, narrowed into rather broad petiole-like bases, whose partly sheathing bases are persistent on the short caudex; scapes typically solitary, 5–15 cm. tall, purple, pubescent below, like the lower surface of the leaf-blades, glabrous or merely inconspicuously pubescent above, corymbosely branched; cymules open, few-flowered, the peduncles and pedicels glabrous or nearly so, purple; sepals broadly oblong or ovate-oblong, about 2 mm. long, glabrous, obtuse; petals white, 4–5 mm. long, orbicular-ovate or orbicular-obovate beyond the short claw; filaments subulate, about as long as the sepals; follicles 3–3.5 mm. high, deep-purple, the stout tips spreading at maturity.

Type collected on Mt. Finlayson, Vancouver Island, May 17, 1887, by John Macoun.
DISTRIBUTION: British Columbia.

28. **Micranthes Howellii** (Greene) Small.

Saxifraga Howellii Greene, Pittonia **2**: 163. 1897.

Leaves ascending or spreading, 1.5–4 cm. long, the blades relatively thin, cuneate or oblong-cuneate, sharply dentate or serrate-dentate, inconspicuously ciliolate, narrowed into slender petiole-like bases; scapes typically solitary, 8–17 cm. tall, glabrous or nearly so, corymbose above; cymules few-flowered, open, the peduncles and pedicels very slender; sepals oblong or ovate-oblong, 1–1.5 mm. long, glabrous, reflexed; petals white, sometimes

drying purplish, oblong, 2.5–3 mm. long, clawless; filaments subulate, very slender; follicles 2.5–3 mm. high, green, the short tips widely spreading.

TYPE LOCALITY: On the Coquell River, Oregon.
DISTRIBUTION: Oregon.

29. **Micranthes virginiensis** (Michx.) Small, Fl. SE. U. S. 501. 1903.

Saxifraga virginiensis Michx. Fl. Bor. Am. **1**: 269. 1803.
Saxifraga vernalis Willd. Hort. Berol. 43. 1805.
Saxifraga virginica Nutt. Gen. 1: 285. 1818.
Dermasea pilosa Haw. Saxifr. Enum. 8. 1821.
Dermasea elongata Haw. Saxifr. Enum. 9. 1821.
Saxifraga pilosa Banks; D. Don, Trans. Linn. Soc. **13**: 386, as synonym. 1822.

Leaves spreading or ascending, 2–15 cm. long, the blades various, ovate, oval or oblong, sinuate, dentate or crenate, often sparingly pubescent on both sides or nearly glabrous, commonly ciliolate, narrowed into petiole-like bases which are typically short, but on plants growing in grassy places they are sometimes greatly elongated; scapes solitary or sparingly tufted, 8–38 cm. tall, glandular-pubescent throughout, sometimes less densely so below, paniculately branched above; cymules becoming open and lax, one axis often elongated, thus forming raceme-like branches at maturity; sepals ovate, 1.5–2 mm. long, mostly obtuse, erect at maturity; petals white, 4–5.5 mm. long, oblong or elliptic, sometimes slightly contracted near the base; filaments subulate; follicles 2.5–3 mm. high, mainly green, the short tips spreading.

TYPE LOCALITY: Virginia.
DISTRIBUTION: New Brunswick to Minnesota, Georgia and Tennessee.
ILLUSTRATIONS: Willd. Hort. Berol. *pl. 43* (as *Saxifraga vernalis*); Lam. Tab. Encyc. *pl. 372*; Bot. Mag. *pl. 1664*; Lodd. Cab. *pl. 1699*; Britt. & Brown, Ill. Fl. *f. 1833*.

30. **Micranthes parvifolia** (Greene) Small.

Saxifraga parvifolia Greene, Pittonia **3**: 116. 1896.

Leaves spreading, 1–4.5 cm. long, the blades suborbicular or broader than long, undulate, crenate, dentate or denticulate, sometimes sparingly pubescent on both sides, barely if at all ciliolate, paler beneath than above, abruptly narrowed into relatively slender petiole-like bases which sometimes exceed the blades in length; scapes solitary or sometimes two or three together, 15–35 cm. tall, relatively slender, rather evenly glandular-pubescent throughout, paniculately branched above, green or purple-tinged near the base; cymules few-flowered, becoming open and ultimately more or less elongated, the peduncles and pedicels very slender, minutely pubescent; sepals ovate, about 1.5 mm. long, glabrous; petals white, spatulate obovate-cuneate, 2–3.5 mm. long, sometimes contracted near the base; filaments subulate; follicles about 2.5 mm. high, purple or purple-tinged, the very short tips spreading.

TYPE LOCALITY: Grant's Pass, Oregon.
DISTRIBUTION: Oregon and California.

31. **Micranthes fallax** (Greene) Small.

Saxifraga fallax Greene, Bull. Torrey Club **23**: 25. 1896.

Leaves ascending or spreading, 4–11.5 cm. long, the blades ovate to oblong, crenate-dentate or merely undulate, bright-green, glabrous or nearly so, narrowed into petiole-like bases which are variable in length; scapes solitary or few together, 15–35 cm. tall, sparingly glandular-pubescent, rather evenly so throughout, but sometimes less densely so near the base, loosely branched above; cymules few-flowered, lax, ultimately open, the peduncles and pedicels filiform and very slender, minutely glandular-pubescent; sepals ovate, commonly broadly so, 1–2 mm. long, glabrous; petals white, cuneate, at least at the base, 2–4 mm. long; filaments subulate; follicles 2.5–3 mm. high, green, the slender tips spreading.

TYPE LOCALITY: Lassen's Peak, California.
DISTRIBUTION: Oregon and California.

32. **Micranthes claytoniaefolia** (Canby) Small.

Saxifraga claytoniaefolia Canby; Small, Bull. Torrey Club **23**: 365. 1896.

Leaves ascending or somewhat spreading, 5–14 cm. long, the blades typically ovate,

sometimes oblong-ovate, generally sparingly denticulate, glabrous or nearly so, mainly truncate or subcordate at the base; scapes usually solitary, 20–50 cm. tall, glandular-pubescent throughout but less densely so below; cymules few- to several-flowered, open, sometimes raceme-like, the peduncles and pedicels slender, copiously glandular-pubescent; sepals ovate, obtuse, 1–1.5 mm. long, glabrous; petals white, cuneate-obovate or obovate-spatulate, 2–3 mm. long, rounded at the apex; filaments subulate; follicles about 2 mm. high, green, the short tips widely spreading.

TYPE LOCALITY: The Dalles, Oregon.
DISTRIBUTION: Washington and Oregon.

33. **Micranthes tennesseensis** Small, Fl. SE. U. S. 501. 1903.

Saxifraga tennesseensis Small, Bull. Torrey Club **23**: 364. 1896.

Leaves spreading, 4–13 cm. long, the blades typically ovate, sometimes suborbicular or oblong-ovate, or occasionally some of the earlier ones orbicular-reniform, dentate or crenate-dentate, pubescent on both sides, ciliate, broadly cuneate to subcordate at the base, sometimes vinous-red beneath; scapes 15–45 cm. tall, glandular-pubescent throughout, rather evenly so but with longer hairs toward the base, paniculate or somewhat corymbosely branched above, the peduncles and pedicels lax or spreading; cymules several- to many-flowered, lax, the main branches early elongated; sepals ovate or triangular-ovate, 1.5–2 mm. long, minutely pubescent; petals white with 2 yellow spots near the base, lanceolate to oblong-lanceolate, 4–4.5 mm. long; filaments subulate; follicles widely spreading at maturity, each 4–5 mm. long, green.

TYPE LOCALITY: Knoxville, Tennessee.
DISTRIBUTION: Tennessee.
ILLUSTRATION: Bull. Torrey Club **21**: *pl. 207* (as *Saxifraga Careyana*).

34. **Micranthes Careyana** (A. Gray) Small, Fl. SE. U. S. 501. 1903.

Saxifraga Careyana A. Gray, Lond. Jour. Bot. **2**: 116. 1843.

Leaves spreading, 2–11 cm. long, the blades ovate to orbicular-ovate or somewhat reniform, dentate or crenate-dentate, green above, sometimes vinous-red beneath, sparingly pubescent, at least much less so than the petioles which commonly exceed the blade in length, mainly truncate or subcordate at the base; scapes generally solitary, 8–32 cm. tall, rather evenly glandular-pubescent throughout but with more numerous glands on the upper part, paniculate above; cymules lax, open, the flowers sometimes widely scattered, the peduncles and pedicels very slender or filiform, thinly glandular-pubescent; sepals ovate, 1–1.5 mm. long, often acutish, glabrous; petals white with 2 yellow spots below the middle, elliptic to oblong, 2.5–3 mm. long; filaments subulate; follicles widely spreading from the base, each 2.5–3 mm. long, green.

TYPE LOCALITY: Ashe County, North Carolina.
DISTRIBUTION: Mountains of North Carolina.

35. **Micranthes eriophora** (S. Wats.) Small.

Saxifraga eriophora S. Wats. Proc. Am. Acad. **17**: 372. 1882.

Leaves spreading, 1.5–3.5 cm. long, the blades ovate or oblong-ovate, crenate, or crenate-dentate, glabrous above, more or less red-tomentose beneath, the broad petiole-like bases long-ciliate; scapes erect, sometimes several together, 8–18 cm. tall, glandular-pubescent; cymules few–flowered, lax, the main axis of each early elongated, the flowers thus becoming remote; sepals broadly triangular, about 1 mm. long, obtuse, glabrous; petals white or pinkish, oblong-spatulate, 4–4.5 mm. long, rounded at the apex, sometimes abruptly narrowed near the base; filaments subulate; follicles 3.5–4 mm. high, the tips widely spreading, usually green.

TYPE LOCALITY: Northern slope of the Santa Catalina Mountains, Arizona.
DISTRIBUTION: Known only from the type locality.

36. **Micranthes micranthidifolia** (Haw.) Small, Fl. SE. U. S. 501. 1903.

Robertsonia micranthidifolia Haw. Syn. Pl. Succ. 322. 1812.
Saxifraga erosa Pursh, Fl. Am. Sept. 311. 1814.
Aulaxis micranthifolia Haw. Saxifr. Enum. 47. 1821.
Saxifraga micranthifolia Steud. Nom. Bot. 736. 1821.
Saxifraga Wolleana T. & G. Fl. N. Am. 1 : 569. 1840.

Leaves erect or ascending, mostly 12–36 cm. long, or some of the early ones shorter, the blades narrowly oblong or linear-oblong to spatulate, coarsely and rather regularly dentate with black-tipped teeth, glandular-ciliolate, gradually narrowed into margined petiole-like bases; scapes 20–90 cm. tall, softly glandular-pubescent, paniculately branched above, the lower branches subtended by somewhat foliaceous bracts; cymules few-flowered, open; sepals oblong to ovate-oblong, 1–1.5 mm. long, commonly sparingly glandular-ciliate, reflexed; petals white with a yellow blotch below the middle, oblong or elliptic to oblong-ovate, each narrowed into a short claw-like base; filaments clavate; follicles widely spreading at maturity, 7–8 mm. long, green.

TYPE LOCALITY: Carolina.
DISTRIBUTION: Mountains, Pennsylvania to North Carolina and Tennessee.
ILLUSTRATION: Britt. & Brown, Ill. Fl. *f. 1832*.

37. **Micranthes Lyallii** (Engler) Small.

Saxifraga Lyallii Engler, Verh. Zoöl.-Bot. Ges. Wien 19: 542. 1869.
Saxifraga dahurica Lyall; Engler, Monogr. Saxifr. 141, as synonym. 1872.
Saxifraga Lyallii laxa Engler, Monogr. Saxifr. 142. 1872.

Leaves erect or ascending, 1.5–6.5 cm. long, the blades flabellate, varying to suborbicular or reniform-flabellate, typically cuneate at the base, coarsely few-toothed above, with the teeth mainly directed forward, glabrous or nearly so, the petiole-like bases often longer than the blade; scapes 8–36 cm. tall, glabrous or nearly so, sparingly branched above; cymules very few-flowered, or flowers solitary, the peduncles and pedicels very slender, commonly purple; sepals ovate to oblong-ovate, 1.5–3 mm. long, glabrous or nearly so, reflexed; petals white with 2 yellow blotches below the middle, 3–4.5 mm. long, broadly oblong to suborbicular above the short claw, often slightly notched at the apex; filaments clavate; follicles 9–12 mm. high, often purple or purple-tinged, commonly 3–5 together.

TYPE LOCALITY: Rocky Mountains of North America about 49° latitude.
DISTRIBUTION: Alaska and the Bering Sea region to Alberta, British Columbia and Montana.

38. **Micranthes davurica** (Willd.) Small.

Saxifraga punctata Pall. Reise 3: 731. 1776. Not *S. punctata* L.
Saxifraga davurica Willd. Sp. Pl. 2: 645. 1799.
Robertsonia davurica Haw. Saxifr. Enum. 56. 1821.

Leaves erect or ascending, 2–6 cm. long, the blades flabellate, sometimes broadly so, cuneate or cuneate-truncate at the base, coarsely few-toothed above, with the teeth directed forward, glabrous or essentially so, sometimes persistent, the broad petiole-like bases as long as the blades or commonly longer; scapes solitary or several together, 8–18 cm. tall, sparingly glandular-pubescent, often purple-tinged, corymbosely branched above; cymules few-flowered, or flowers solitary, the peduncles and pedicels often bearing a few scattered glandular hairs; sepals ovate, 1–1.5 mm. long, obtuse, glabrous, reflexed; petals white, 2–2.5 mm. long, the oblong or elliptic blade narrowed into a slender claw; filaments slender-clavate; follicles erect, 7–9 mm. high, purple, sometimes more than two together.

TYPE LOCALITY: Siberia.
DISTRIBUTION: Islands of Bering Sea and eastern Siberia.

39. **Micranthes flabellifolia** (R. Br.) Small.

?*Saxifraga unalaschensis* Sternb. Suppl. Rev. Saxifr. 2: 9. 1831.
Saxifraga flabellifolia R. Br.; T. & G. Fl. N. Am. 1: 569. 1840.

Leaves mainly ascending, 2–7 cm. long, the blades flabellate, sometimes broadly so, usually sparingly pubescent, coarsely few-toothed, with the teeth mainly directed forward, cuneately narrowed into the broad petiole-like bases which usually about equal the blade

in length; scapes 5–16 cm. tall, often curved, glandular-villous throughout, purple or purple-tinged, corymbosely branched above, the peduncles and pedicels markedly villous; cymules few-flowered, or flowers solitary; sepals ovate, sometimes sparingly ciliolate, about 2.5 mm. long, obtuse, reflexed; petals white, 4–4.5 mm. long, ovate or orbicular-ovate, narrowed into a short claw-like base, commonly slightly notched at the apex; filaments clavate; follicles stout, erect, 8–10 mm. high, commonly 3–5 together, purple.

TYPE LOCALITY: Unalaska.
DISTRIBUTION: Islands of Bering Sea.

40. **Micranthes Kumlienii** Small, sp. nov.

Leaves spreading or ascending, 2–3.5 cm. long, the blades ovate to oblong-ovate, dentate, sparingly pubescent with the hairs more numerous beneath than above, usually longer than the petiole-like bases; scapes 10–20 cm. tall, copiously glandular-villous, but more so above than near the base; inflorescence capitate, the bracts purple; sepals triangular-ovate, 2.5–3 mm. long, often sparingly glandular-ciliolate; petals white, barely as long as the sepals, the narrowly oval blades rounded at the apex, narrowed into short claws; filaments clavate; follicles not seen.

Type collected at Quickstep Harbor, Cumberland Sound, July 8, 1878, by L. Kumlien, *no. 993*.
DISTRIBUTION: Baffin Land.

41. **Micranthes franciscana** Small, sp. nov.

Leaves ascending or spreading, 2–4 cm. long, the blades ovate to oblong-ovate, undulate-crenate, nearly glabrous, except the glandular-ciliolate margins, rather abruptly narrowed into broad petiole-like bases which rarely equal the blade in length; scapes 3–6.5 cm. tall, closely glandular-pubescent, densely so above; inflorescence ovate, usually broadly so, about 2 mm. long, glabrous or nearly so; petals white, suborbicular or broadly oval, notched at the apex, clawless; filaments clavate; follicles not seen.

Type collected on San Francisco Mountains, Arizona, June 9, 1887, by E. A. Mearns, *no. 26*.

42. **Micranthes occidentalis** (S. Wats.) Small.

Saxifraga occidentalis S. Wats. Proc. Am. Acad. **23**: 264. 1888.

Leaves spreading, 2–6.5 cm. long, the blades ovate to oblong or oval, dentate or crenate-dentate, abruptly narrowed and cuneate at the base, usually minutely pubescent beneath, sometimes closely so when young; scapes 4–19 cm. tall, often purplish, copiously glandular-pubescent, very densely so above, narrowly paniculate, or somewhat corymbose at the top, the peduncles and pedicels relatively short during anthesis, somewhat elongated at maturity; sepals ovate, 1.5–2 mm. long, obtuse, occasionally sparingly ciliolate, reflexed; petals white, 2–3.5 mm. long, rounded at the apex, the blades oval to oval-ovate, rather abruptly narrowed into short claw-like bases; filaments clavate; follicles about 2 mm. high, purple, the short tips widely spreading.

TYPE LOCALITY: Rocky Mountains.
DISTRIBUTION: Alberta to Montana.

43. **Micranthes Allenii** Small, sp. nov.

Leaves spreading or somewhat ascending, 1.5–7.5 cm. long, the blades typically ovate, sometimes broadly so or orbicular-ovate, occasionally oblong-ovate, crenate, sparingly lanuginous beneath, the hairs partially deciduous in age; scapes 6–21 cm. tall, glandular-pubescent throughout but more densely so above, corymbosely paniculate, the cymules commonly few-flowered, the lower peduncles elongated in age; sepals ovate, sometimes sparingly ciliolate, 1.5–3 mm. long, reflexed; petals white, 3–3.5 mm. long, notched at the apex, the blades oval to obovate, narrowed into broad claw-like bases; filaments clavate; follicles about 3 mm. high, purple, the rather long tips widely spreading.

Type collected on Goat Mountains, Washington, June 27, 1896, by O. D. Allen, *no. 242*.
DISTRIBUTION: Washington.

44. **Micranthes aequidentata** Small, sp. nov.

Leaves spreading or ascending, 2–8 cm. long, the blades typically ovate, oblong-ovate or oval, more or less pubescent beneath with reddish hairs, crenate, cuneately narrowed or truncate at the base; scapes 7–18 cm. tall, green or occasionally purple-tinged, thinly glandular-pubescent, very closely so above, rather corymbosely branched, the peduncles and pedicels elongated in age; cymules ultimately lax, few-flowered; sepals ovate or oblong, 1.5–2 mm. long, sometimes ciliolate, reflexed; petals white, 3–4 mm. long, oblong, notched at the apex, abruptly narrowed at the base; filaments broadly clavate; follicles 3–4 mm. high, green or purple-tinged, the rather slender tips spreading.

Type collected at the Lower Cascades, Skamania County, Washington, May 29, 1886, by W. N. Suksdorf, *no. 967*.
DISTRIBUTION: Washington.

45. **Micranthes saximontana** (E. Nelson) Small.

Saxifraga saximontana E. Nelson, Erythea **7**: 168. 1899.
Saxifraga idahoensis Piper, Bull. Torrey Club **27**: 394. 1900.

Leaves spreading, 3–9 cm. long, the blades typically ovate, varying to oblong-ovate or occasionally oblong, dentate or crenate, sparingly pubescent, at least when young, commonly glabrous at maturity, except the margins, the petiole-like bases commonly about as long as the blades; scapes 9–19 cm. tall, glandular-pubescent throughout, commonly more densely so above, rather corymbosely branched, the peduncles and pedicels elongated; cymules few-flowered, lax; sepals ovate to oblong-ovate, 1.5–2 mm. long, sometimes ciliolate, reflexed; petals white, 2–3 mm. long, the blades oval to ovate or sometimes slightly broadest above the middle, rounded at the apex, narrowed into short claw-like bases; filaments clavate; follicles about 3 mm. high, the short slender tips ascending or spreading.

TYPE LOCALITY: Sundance, Wyoming.
DISTRIBUTION: Montana, Idaho and Wyoming.

46. **Micranthes yukonensis** Small, sp. nov.

Leaves spreading, 4–6 cm. long, the blades oblong to obovate or orbicular-obovate, rather coarsely dentate, finely pubescent on both sides, sometimes vinous-red beneath, the teeth purple-tipped, the petiole-like bases mostly shorter than the blades, rather copiously ciliate; scapes usually several together, 9–17 cm. tall, purple or purple-tinged, sparingly glandular-pubescent throughout, corymbosely branched above, the peduncles and pedicels elongated in age; cymules few-flowered, lax; sepals ovate, about 2 mm. long, generally ciliolate, reflexed; petals white, 1.5–2 mm. long, the blades oblong, rounded at the apex, generally with two minute yellowish spots below the middle, narrowed into claw-like bases; filaments clavate; follicles about 2 mm. high, usually purple-tinged, the short stout tips ascending or spreading.

Type collected at Dawson, Yukon Territory, July 30, 1899, by R. S. Williams.
DISTRIBUTION: Yukon Territory.

47. **Micranthes lata** Small, sp. nov.

Leaves spreading, 3–5.5 cm. long, the blades ovate to oblong-ovate, ciliolate, crenate or crenate-dentate, finely pubescent on both sides, glabrate in age, narrowed into petioles that are usually shorter than the blades; scapes 14–23 cm. tall, glandular-pubescent especially above, paniculately branched, the peduncles and pedicels elongated; cymules few-flowered, open; sepals ovate, about 1.5 mm. long, mainly glabrous, reflexed; petals white, orbicular or broader than long, rounded at the base with no indication of a claw; filaments clavate; follicles 2–2.5 mm. high, purple, the stout tips spreading.

Type collected at Lytton, British Columbia, April 16, 1889, by John Macoun.
DISTRIBUTION: British Columbia to California.

48. **Micranthes Marshallii** (Greene) Small.

Saxifraga Marshallii Greene, Pittonia **1**: 159. 1888.

Leaves mostly ascending, 4–9 cm. long, the blades ovate to oblong-ovate, crenate or crenate-dentate, more or less pubescent beneath with reddish hairs, glabrous or essentially

so, and bright-green above, mainly truncate or subcordate at the base, commonly shorter than the petiole-like bases; scapes 13–33 cm. tall, thinly glandular-pubescent throughout, green, rather corymbosely branched above; cymules open, the peduncles and pedicels elongated, pubescent like the scape; sepals ovate or oblong-ovate, 1.5–2.5 mm. long, usually glandular-ciliolate, reflexed; petals white with 2 yellow blotches below the middle, 2.5–3.5 mm. long, obtuse, oblong, often somewhat cuneate at the base; filaments clavate; follicles 2.5 mm. high, green, the slender tips spreading.

TYPE LOCALITY: Hoopa Valley, Humboldt County, California.
DISTRIBUTION: Oregon and California.

49. **Micranthes reflexa** (Hook.) Small.

Saxifraga reflexa Hook. Fl. Bor. Am. 1: 249. 1832.
Sleiranisia reflexa Raf. Fl. Tell. 2: 69. 1836.
Saxifraga radulina Greene, Pittonia 3: 308. 1898.

Leaves spreading, 1.5–4.5 cm. long, the blades ovate to oblong, coarsely crenate, often purple beneath, minutely and rather closely grayish-pubescent on both sides, cuneate to truncate at the base, mainly longer than the broad petiole-like bases; scapes commonly several together, more or less glandular-pubescent, usually purple-tinged, corymbosely branched above; cymules few-flowered, open, the peduncles and pedicels relatively short; sepals ovate-lanceolate, 2–2.5 mm. long, ciliate, reflexed; petals white with 2 yellow blotches below the middle, 3–3.5 mm. long, often obtuse, clawless; filaments very broadly clavate, sometimes clavate-spatulate; follicles about 2 mm. high, purple, the bodies erect with the short stout tips spreading or recurved-spreading.

TYPE LOCALITY: Shores of the Arctic Sea, between the Mackenzie and Coppermine rivers.
DISTRIBUTION: Arctic North America.
ILLUSTRATION: Hook. Fl. Bor. Am. *pl. 85*.

50. **Micranthes caroliniana** (A. Gray) Small.

Saxifraga caroliniana A. Gray, Mem. Am. Acad. II. 3: 39. 1846.
Saxifraga Careyana caroliniana Engler, Monogr. Saxifr. 137. 1872.
Saxifraga Grayana Britton, Mem. Torrey Club 5: 178. 1894.
Micranthes Grayana Small, Fl. SE. U. S. 501. 1903.

Leaves mainly ascending or erect, 5–19 cm. long, the blades ovate, oval, suborbicular, or broadly oblong, dentate, more or less pubescent on both sides or glabrate above, ciliate, cuneate or subcordate at the base, often purplish beneath, commonly longer than the more pubescent petiole-like bases; scapes 9–55 cm. tall, rather coarsely glandular-pubescent, green, paniculately branched; cymules open, ovate, diffuse, the peduncles and pedicels slender and elongating; sepals ovate to ovate-lanceolate, 1.5–2 mm. long, reflexed, commonly not ciliolate; petals white, with 2 yellow blotches below the middle, 3–3.5 mm. long, the ovate obtuse blades narrowed into short distinct claws; filaments slender-clavate; follicles about 3 mm. high, green, the bodies more or less spreading, with slender spreading tips.

TYPE LOCALITY: Mountains of North Carolina.
DISTRIBUTION: Mountains, Virginia and North Carolina.
ILLUSTRATION: Britt. & Brown, Ill. Fl. *f. 1837*.

51. **Micranthes spicata** (D. Don) Small.

Saxifraga Geum Pursh, Fl. Am. Sept. 311. 1814. Not *S. Geum* L. 1753.
Saxifraga spicata D. Don, Trans. Linn. Soc. 13: 354. 1822.

Leaves erect or ascending, 6–8.5 cm. long, the blades suborbicular, or orbicular-ovate, thick, 3–5 cm. in diameter, dentate or crenate-dentate, with conspicuously stout gland-tipped teeth, minutely pubescent on both sides, deeply cordate at the base, mainly as long as the more pubescent petioles or longer; scapes erect, 18–38 cm. tall, glandular-pubescent, more densely so above than below, thyrsoid; cymules few-flowered, open, with the lower peduncles but slightly longer than the upper, the lower bract somewhat foliaceous; sepals oblong-ovate to ovate-lanceolate, 1.5–2 mm. long, usually not ciliolate, reflexed; petals white, 3–5 mm. long, slightly notched at the apex, oblong, more or less distinctly clawed;

filaments slender-clavate; follicles 6–7.5 mm. high, the bodies erect with slender spreading tips.

TYPE LOCALITY: On the northwest coast (of North America).
DISTRIBUTION: Alaska to British Columbia.

52. **Micranthes galacifolia** Small.

Saxifraga galacifolia Small, Bull. N. Y. Bot. Gard. **2**: 172. 1901.

Leaves erect or ascending, 7–22 cm. tall, the blades ovate to orbicular-ovate or oval, thin, 4–8 cm. in diameter, dentate or crenate-dentate with slenderly gland-tipped teeth, deeply cordate at the base, sparingly pubescent on both sides, much shorter than the elongated somewhat villous slender petioles; scapes 28–42 cm. tall, glandular-villous, especially above, thyrsoid; cymules few-flowered, open, the lower peduncles only slightly longer than the upper, subtended by leaf-like bracts; sepals ovate or oblong-ovate, 2–2.5 mm. long, not ciliolate, reflexed; petals white, oblong to oblong-cuneate, 3–5 mm. long, often somewhat persistent below the fruit; filaments slender-clavate; follicles 10–11 mm. high, the bodies erect with rather slender spreading tips.

TYPE LOCALITY: Near Indian River, Yukon.
DISTRIBUTION: Known only from the type locality.

53. **Micranthes Nelsoniana** (D. Don) Small.

Saxifraga Nelsoniana D. Don, Trans. Linn. Soc. **13**: 355. 1822.

Leaves erect or ascending, 3–14 cm. long; blades suborbicular to reniform, 2–4.5 cm. in diameter, deeply cordate at the base, usually sparingly pubescent on both sides, coarsely few-toothed with crenate gland-tipped teeth, shorter than the more copiously pubescent, often villous petioles; scapes erect or ascending, 4–17 cm. tall, glandular-villous especially above, terminating in a compact head usually with purple or purplish bracts; sepals ovate to oblong-ovate, 1.5–2 mm. long, ciliate; petals white, broadly oblong to ovate, 3–4.5 mm. long, rounded at the apex, mostly narrowed into short claw-like bases; filaments broadly clavate; follicles not seen.

TYPE LOCALITY: Cape Newnham, coast of northwestern North America.
DISTRIBUTION: Alaska and adjacent islands to British Columbia.

54. **Micranthes aestivalis** (F. & M.) Small.

Saxifraga aestivalis F. & M. Ind. Sem. Hort. Petrop. 1: 37. 1835.

Leaves erect or ascending, 4–16 cm. long, the blades suborbicular to reniform, 2–5.5 cm. in diameter, coarsely few-toothed with crenate or dentate gland-tipped teeth, deeply cordate at the base, glabrous or nearly so, much shorter than the slender glabrous or almost glabrous petioles; scapes mostly erect, sometimes assurgent, 9–27 cm. tall, somewhat corymbosely branched at the top, usually sparingly pubescent and rather inconspicuously so or almost glabrous; cymules open, the peduncles and pedicels elongated, more pubescent than the scapes; sepals oblong to oblong-ovate, 1–1.5 mm. long, ciliate, reflexed; petals white, 3–4.5 mm. long, mostly notched at the apex, the elliptic, oblong or ovate blades narrowed into short claws; filaments clavate; follicles 5–6 mm. long, the bodies erect with slightly spreading short stout tips, purple.

TYPE LOCALITY: Not given.
DISTRIBUTION: Alaska and adjacent islands to Alberta and Washington; also in northeastern Siberia.

55. **Micranthes arguta** (D. Don) Small.

Saxifraga arguta D. Don, Trans. Linn. Soc. **13**: 356. 1822.
Saxifraga punctata authors generally. Not *S. punctata* L.
Saxifraga denudata Nutt.; T. & G. Fl. N. Am. 1: 567. 1840. Not *S. denudata* D. Don. 1822.
? *Saxifraga punctata acutidentata* Engler, Verh. Zool.-Bot. Ges. Wien **19**: 548. 1869.

Leaves erect or ascending, 9–28 cm. long, the blades suborbicular to orbicular-reniform, 3–9 cm. in diameter, copiously crenate or crenate-dentate with gland-tipped teeth, deeply cordate at the base, usually glabrous or nearly so, much shorter than the relatively slender petioles, which are also glabrous or essentially so; scapes 14–46 cm. tall, glabrous or nearly so at least below, commonly somewhat glandular-pubescent near the top, paniculate above;

cymules open, few-flowered, the peduncles and pedicels commonly purple, finely glandular-pubescent, elongating in age; sepals lanceolate to oblong, 1.5–2 mm. long, sometimes glandular-ciliolate, reflexed, commonly purple; petals white with 2 yellow blotches below the middle, 2.5–3.5 mm. long, the suborbicular or reniform blades narrowed into slender claws; filaments clavate; follicles 6–8 mm. high, ovate, purple or purple-tinged, the bodies erect, with rather slender spreading or recurved tips.

TYPE LOCALITY: Coasts of northwestern North America.
DISTRIBUTION: British Columbia to Montana, New Mexico and California.

56. **Micranthes Geum** (L.) Small.

Saxifraga Geum L. Sp. Pl. 401. 1753.

Leaves spreading or ascending, 4–8.5 cm. long, the blades suborbicular, 1.5–3 cm. in diameter, somewhat hirsute, dentate or crenate-dentate with rather coarse teeth, cordate or truncate at the base, shorter than the densely hirsute petioles; scapes 11–23 cm. tall, less hirsute than the petioles, rather corymbosely branched above; cymules open, few-flowered, the peduncles and pedicels slender, elongating, more finely pubescent and more glandular than the scape; sepals oblong to oblong-ovate, 2–2.5 mm. long, glandular-ciliolate, reflexed; petals white, 3–3.5 mm. long, oblong or nearly so, sessile; filaments clavate; follicles 4–5 mm. high, the bodies erect with spreading or ascending-spreading tips.

TYPE LOCALITY: Switzerland.
DISTRIBUTION: Newfoundland. Also in Europe.
ILLUSTRATIONS: Engl. Bot. **22**: *pl. 1561;* Lam. Tab. Encyc. *pl. 372;* Reichenb. Icon. Crit. **7**: *pl. 628*.

26. **SPATULARIA** Haw. Saxifr. Enum. 47. 1821.

Hydatica Neck. (Elem. **2**: 387. 1790; hyponym); S. F. Gray, Nat. Arr. Brit. Pl. **2**: 530. 1821.
Hexaphoma Raf. Fl. Tell. **2**: 66. 1836.

Perennial acaulescent herbs, with erect branching scapes from a short or sometimes slightly elongated caudex. Leaves alternate, all basal; blades of a spatulate type, or broadest above the middle, toothed, at least near the apex, or rarely entire, narrowed into elongated petiole-like bases. Flowers in open cymes, their parts sometimes changed into bulblets, these clusters of bulblets then wholly or partially replacing the normal inflorescence. Hypanthium much shorter than the calyx. Sepals 5, reflexed at maturity. Corolla irregular, white. Petals various, all clawed, the three upper with ovate, lanceolate or sagittate blades, the two lower with elliptic or spatulate blades, or in species whose plants bear a single terminal flower, the lower simulate the upper, and the blades are narrower and more narrowed at the base. Filaments subulate. Ovary chiefly superior, the carpels united at the base or to below the middle. Follicles erect, with ascending or diverging tips. Seeds papillose-striate.

Type species, *Saxifraga leucanthemifolia* Michx.

Inflorescence with bulblets.
- Plants with all the flowers represented by clusters of bulblets, or with a single flower terminating the main axis.
  - Leaf-blades entire or essentially so; pedicels nodding or drooping. 1. *S. bryophora.*
  - Leaf-blades manifestly toothed; pedicels ascending or erect.
    - Leaf-blades with 3–5 usually blunt teeth at the apex. 2. *S. foliolosa.*
    - Leaf-blades rather sharply toothed above the middle. 3. *S. Vreelandii.*
- Plants with many flowers and some bulblets, at least with a flower terminating each branch of the stem. 4, *S. Brunoniana.*

Inflorescence without bulblets.
- Upper petals 7.5–8 mm. long. 5. *S. Newcombei.*
- Upper petals 3–5 mm. long.
  - Primary bracts of the inflorescence small, not leaf-like.
    - Follicles less than 5.5 mm. long; leaves copiously pubescent with ultimately reddish hairs. 6. *S. ferruginea.*
    - Follicles over 5.5 mm. long; leaves more or less pubescent with permanently pale hairs. 7. *S. stellaris.*
  - Primary bracts of the inflorescence leaf-like. 8. *S. petiolaris.*

1. **Spatularia bryophora** (A. Gray) Small.

Saxifraga bryophora A. Gray, Proc. Am. Acad. 6: 533. 1865.
Saxifraga leucanthemifolia integrifolia Engler, Monogr. Saxifr. 135. 1872.

Plants 0.5–2 dm. tall, finely glandular-pubescent; leaves crowded at the top of the

slender caudex, the blades linear-elliptic to oblong-oblanceolate, 0.5–2.5 cm. long, entire or shallowly toothed near the apex, rather blunt; scapes solitary or tufted, paniculately branched above, the branches ultimately spreading; pedicels nodding or drooping; cymes not congested; flower solitary at the end of the main stem; sepals oblong to ovate, 1.5–2.5 mm. long; petals 3.5–4 mm. long, the 3 upper with ovate blades cordate at the base, the 2 lower with ovate blades abruptly narrowed at the base; follicles 4 mm. long, the style-tips diverging.

TYPE LOCALITY: Ebbett's Pass, California.
DISTRIBUTION: Sierra Nevada mountains, California.

2. **Spatularia foliolosa** (R. Br.) Small.

Saxifraga stellaris comosa Poir. in Lam. Encyc. **6**: 680. 1804.
Saxifraga foliolosa R. Br. Chlor. Melv. 17. 1823.
Saxifraga stellaris prolifera Cham.; Engler, Monogr. Saxifr. 133. 1872.
Saxifraga comosa Britton, Mem. Torrey Club **5**: 178. 1894.

Plants 0.5–1.5 dm. tall, glabrous or sparingly glandular-pubescent; leaves few, crowded on the short caudex, the blades oblong-cuneate to cuneate or oblanceolate, 0.8–1.5 cm. long, shallowly 3–5-toothed near the apex; scapes usually solitary, paniculate above, the branches ascending; pedicels not nodding; flower solitary at the end of the main stem; cymes aggregated into a globular mass of bulblets; sepals ovate, 0.7–1 mm. long; petals 4–4.5 mm. long, the 3 upper with oblong-ovate or oval-ovate cordate blades, the 2 lower with relatively narrower blades, not cordate; follicles not seen.

TYPE LOCALITY: Melville Island.
DISTRIBUTION: Circumboreal, southward to the mountains of Maine; also in Europe and Asia.
ILLUSTRATION: Britt. & Brown, Ill. Fl. *f. 1835*, as *Saxifraga comosa*.

3. **Spatularia Vreelandii** Small, sp. nov.

Plant 0.6–2 dm. tall, minutely glandular-pubescent; leaves crowded on the short caudex, the blades spatulate to linear-spatulate, 1.5–6 cm. long, sharply toothed near the apex or above the middle; scapes solitary or sparingly tufted, loosely paniculate above or rarely with congested cymes; bracts similar to the leaves, but smaller.

Type collected at Glacier Basin, Montana, Aug. 5, 1901, by F. K. Vreeland, *no. 1048*.
DISTRIBUTION: British Columbia to Montana and Colorado.

4. **Spatularia Brunoniana** (Bong.) Small.

Saxifraga stellaris Brunoniana Bong. Mem. Acad. St. Petersb. VI. **2**: 140. 1832.
Saxifraga leucanthemifolia Brunoniana Engler, Monogr. Saxifr. 135. 1872.
Saxifraga notkana Moç.; Engler, Monogr. Saxifr. 135, as a synomym. 1872.
Saxifraga Bongardi Presl; Engler, Monogr. Saxifr. 135, as a synomym. 1872.

Plants 1–4 dm. tall, rather copiously glandular-pubescent; leaves crowded on the short caudex, the blades spatulate to oblanceolate-spatulate, 2–8 cm. long, or rarely shorter, sharply or sometimes broadly toothed mostly above the middle; scapes solitary or several together, rather widely paniculate, the branches ascending; bracts much smaller than the leaves, except the lower one or two; flowers terminating the stem, branches and branchlets, but on many of the ultimate branchlets represented by clusters of bulblets; sepals oblong-ovate to triangular-ovate, 1–1.5 mm. long; petals 3.5–6 mm. long, the 3 upper with lanceolate or oblong-lanceolate blades, the 2 lower with elliptic or spatulate-elliptic blades; follicles 4–6 mm. long, the style-tips divergent.

TYPE LOCALITY: Sitka.
DISTRIBUTION: Alaska to British Columbia, Montana and Oregon, and on the adjacent islands.

5. **Spatularia Newcombei** Small.

Saxifraga Newcombei Small, Torreya **2**: 55. 1902.

Plants 1.2–2.2 dm. tall, glandular-villous; leaves crowded on the short caudex, the blades spatulate, 4–8 cm. long, sessile, coarsely serrate-dentate above the middle, more or less glandular-pubescent and ciliate; scapes solitary, erect, simple below the inflorescence, corymbosely branched above; bracts similar to the leaves, but smaller and relatively less toothed; sepals ovate to oval, 3–5 mm. long, obtuse, glabrous or nearly so, usually purple;

petals white, the 3 upper 7.5 mm. long, with lanceolate or oblong-lanceolate bimaculate blades, truncate or cordate at the base, the claws about 1 mm. long, the 2 lower petals with oblong or elliptic blades 8 mm. long; fruit not seen.

TYPE LOCALITY: Queen Charlotte Islands, British America.
DISTRIBUTION: Known only from the type locality.

6. **Spatularia ferruginea** (Graham) Small.

Saxifraga ferruginea Graham, Edinb. New Phil. Jour. **1828**: 348. 1829.
Hexaphoma ferruginea Raf. Fl. Tell. **2**: 66. 1836.

Plants 1–1.5 dm. tall, pubescent throughout with ultimately reddish hairs; leaves crowded on the short caudex, the blades spatulate to oblanceolate, 1.5–6.5 cm. long, prominently toothed near the apex or above the middle, copiously pubescent, especially beneath; scapes solitary or several together, corymbosely branched above; bracts much smaller than the leaves; flowers not replaced by clusters of bulblets; sepals ovate, 1.5–2 mm. long, sparingly ciliate; petals 3.5–4 mm. long, the 3 upper with lanceolate-cordate blades, the 2 lower with eiliptic or spatulate blades; follicles 4.5–5 mm. long, the minute style-tips spreading.

TYPE LOCALITY: Arctic America? First described from plants raised from seeds in the Edinburgh Botanical Garden.
DISTRIBUTION: Alaska to British Columbia.
ILLUSTRATION: Bot. Mag. *pl. 2959* (as *Saxifraga leucanthemifolia*).

7. **Spatularia stellaris** (L.) Haw. Saxifr. Enum. 49. 1821.

Saxifraga stellaris L. Sp. Pl. 400. 1753.
Saxifraga stellaris pauciflora Engler, Monogr. Saxifr. 133. 1872.

Plants 0.4–3 dm. tall, the caudex commonly somewhat elongated; leaves approximate or crowded at the end of the caudex, the blades oblong-oblanceolate to narrowly or broadly spatulate, 1.5–7.5 cm. long, sharply toothed above the middle or in small plants only near the apex, sparingly pubescent or almost glabrous; scapes solitary or tufted, corymbose above; bracts much smaller than the leaves; flowers not replaced by clusters of bulblets; sepals ovate-lanceolate or oblong-lanceolate, nearly glabrous; petals 4.5–5 mm. long, the 3 upper with lanceolate blades truncate at the base, the 2 lower spatulate; follicles 6–6.5 mm. long, the short style-beaks spreading.

TYPE LOCALITY: Sweden.
DISTRIBUTION: Circumboreal; also in alpine Europe and Asia.
ILLUSTRATIONS: L. Fl. Lapp. *pl. 2*; Scop. Fl. Carn. **1**: *pl. 13*; Fl. Dan. **1**: *pl. 23*; Jacq. Coll. **1**: *pl. 13*; Engl. Bot. **3**: *pl. 167*; Curt. Fl. Lond. **4**: *pl. 69*; Sturm, Deutsch. Fl. **9**: *pl. 35*.

8. **Spatularia petiolaris** (Raf.) Small.

Saxifraga leucanthemifolia Michx. Fl. Bor. Am. 1: 268. 1803. Not *S. leucanthemifolia* La Peyr. 1803.
Spatularia leucanthemifolia Haw. Saxifr. Enum. 48. 1821.
Hexaphoma petiolaris Raf. Fl. Tell. **2**: 67. 1836.
Saxifraga Michauxii Britton, Mem. Torrey Club **4**: 118. 1894.
Spatularia Michauxii Small, Fl. SE. U. S. 502. 1903.

Plants 2–5 dm. tall or rarely smaller, pubescent, the caudex very short; leaves crowded, the blades spatulate, 5–12 cm. long, or sometimes shorter, sharply and coarsely toothed especially above the middle, more pubescent on the narrow petiole-like bases than above; scapes solitary or several together, often shaggy-pubescent, widely branched; bracts leaf-like, at least those on the main axis; flowers numerous, none replaced by bulblets; sepals oblong-ovate to lanceolate, 1–2 mm. long; petals 3.5–5.5 mm. long, the 3 upper with lanceolate blades truncate at the base, the 2 lower with elliptic or spatulate blades; follicles 4.5–5 mm. long, the style-tips slightly spreading.

TYPE LOCALITY: Mountains of the Carolinas.
DISTRIBUTION: Alleghenies, Virginia to Georgia.
ILLUSTRATIONS: Lodd. Bot. Cab. *pl. 1568*; Britt. & Brown, Ill. Fl. *f. 1838*.

27. **LEPTARRHENA** R. Br. Chlor. Melv. 15. 1823.

Perennial caulescent herbs, with short leafy caudices and sparingly leafy flower-stalks. Leaves alternate, approximate on the caudex, remote and very few on the flower-stalk;

blades leathery, toothed, narrowed into petiole-like bases. Flowers in thyrsoid-paniculate cymes. Hypanthium flattish, about as long as the calyx. Sepals 5, erect. Corolla white, regular. Petals 5, narrow, broadened upward, persistent. Stamens 10; filaments subulate. Ovary slightly inferior, the carpels united only at the base. Follicles seated on the hypanthium, erect, except the slightly spreading tips. Seeds cellular-reticulated, produced into a tail or erect end.

Type species, *Saxifraga amplexifolia* Sternb.

1. **Leptarrhena pyrolifolia** (D. Don) R. Br.; Seringe, in DC. Prodr. **4**: 48. 1830.

Saxifraga pyrolifolia D. Don, Trans. Linn. Soc. **13**: 389. 1822.
?*Saxifraga amplexifolia* Sternb. Rev. Saxifr. Suppl. 1: 2. 1822.
Leptarrhena amplexifolia R. Br.; Seringe, in DC. Prodr. **4**: 48. 1830.

Caudex horizontal or ascending, clothed with the imbricated leaf-bases; leaf-blades leathery, oblong or sometimes slightly broadest above or below the middle, 3–9 cm. long, obtuse, serrate or crenate-serrate, deep-green or lustrous above, paler beneath, narrowed into winged petiole-like bases; flower-stalks 1–5 dm. tall, bearing 1 or 2 clasping leaves; cymes at first congested, becoming separated; peduncles 5–25 mm. long; sepals ovate, about as long as the hypanthium, each with a terminal gland and usually some lateral glands; petals narrowly spatulate or oblong-oblanceolate, 2–2.5 mm. long; fruit conic-ovoid, 8–10 mm. long.

TYPE LOCALITY: Kamtschatka.
DISTRIBUTION: Islands and mainland from the Bering Sea region to Washington.
ILLUSTRATIONS: Hook. Fl. Bor. Am. *pl. 89;* E. & P. Nat. Pfl. 3^{2a}: *f. 25.*

28. **LEPTASEA** Haw. Saxifr. Enum. 39. 1821.

Hirculus Haw. Saxifr. Enum. 40. 1821.
Ciliaria Haw. Saxifr. Enum. 41. 1821.
Kingstonia S. F. Gray, Nat. Arr. Brit. Pl. **2**: 531. 1821.

Perennial more or less gregarious or matted caulescent herbs, with copiously leafy caudices and offsets, and less leafy flower-stalks. Leaves alternate, fleshy or parchment-like; blades entire, ciliate or rarely with 3 apical tooth-like lobes, sessile. Flowers solitary or in terminal simple or compound cymes. Hypanthium small, much shorter than the calyx. Sepals 5, often spreading or reflexed. Corolla white or yellow, regular. Petals 5, with claw-like bases or claws. Stamens 10; filaments subulate to clavate. Ovary mostly superior, the carpels united to above the middle. Follicles erect, except the more or less spreading tips, surmounting the hypanthium. Seeds granular or rugose.

Type species, *Saxifraga aizoides* L.

Filaments subulate.
  Corolla present; flower-stalks leafy.
    Leaf-blades not spine-tipped at the apex, more or less ciliate.
      Flowers normally solitary, sometimes 2 together; petals 5.5–13 mm. long; flower-stalks bearing smaller leaves than the caudices.
        Petals suborbicular or oval, 5.5–6.5 mm. long, each abruptly narrowed into a short claw.
          Leaf-blades very thick, those of the caudex spatulate-clavate, curved.
            Sepals ascending or erect; species of the northwest coast. 1. *L. serpyllifolia.*
            Sepals reflexed; species of the Rocky Mountain region. 2. *L. chrysantha.*
          Leaf-blades flat, those of the caudex elliptic, straight. 3. *L. alaskana.*
        Petals elliptic to oblong, 9–13 mm. long, clawless. 4. *L. Hirculus.*
      Flowers normally several in terminal cymes; petals 3–4.5 mm. long; flower-stalks bearing larger leaves than the caudices. 5. *L. aizoides.*
  Leaf-blades spine-tipped at the apex.
    Petals oblong, oblong-lanceolate, oval or elliptic.
      Leaf-blades entire, with a single spine at the apex.
        Leaf-blades eciliate, fleshy; flower-stalks bearing larger leaves than the caudices. 6. *L. Van-Bruntiae.*
        Leaf-blades ciliate, parchment-like; flower-stalks bearing smaller leaves than the caudices.
          Petals clawless.
            Leaves of the caudices converging and forming globular masses; petals about 3 mm. long. 7. *L. cherlerioides.*

Leaves of the caudices spreading; petals 5–7 mm. long.
Petals oval or oval-ovate; leaves of the caudex with spatulate or oblong-spatulate blades. 8. *L. vespertina.*
Petals oblong or oblong-lanceolate; leaves of the caudex with subulate blades. 9. *L. austromontana.*
Petals gradually narrowed into claws. 10. *L. Funstonii.*
Leaf-blades with 3 tooth-like lobes at the apex, the lobes spine-tipped. 11. *L. tricuspidata.*
Petals broadly obovate. 12. *L. flagellaris.*
Corolla wanting; flower-stalks leafless. 13. *L. fimbriata.*
Filaments clavate.
Flowers solitary or 2 or 3 together; leaves of the caudices about twice as long as broad or less. 14. *L. Tolmiei.*
Flowers several or many together; leaves of the caudices several times longer than wide. 15. *L. ledifolia.*

1. **Leptasea serpyllifolia** (Pursh) Small.

Saxifraga serpyllifolia Pursh, Fl. Am. Sept. 310. 1814.
Saxifraga Fisheri Seringe, in DC. Prodr. 4: 22. 1830.
Saxifraga planifolia Sternb.; Cham. Linnaea 6: 555. 1831.
?*Saxifraga bicolor* Sternb. Rev. Saxifr. Suppl. 2: 49. 1832.

Leaves of the caudices 4.5–11.5 mm. long, the blades very thick, spatulate-clavate, obtuse, curved, glabrous; flower-stalks 1.5–4.5 cm. tall, glandular-pubescent, bearing few somewhat pubescent leaves; sepals broadly ovate, 2–2.5 mm. long, obtuse, sparingly ciliate; petals light-yellow, 6–7 mm. long, the oval or oval-orbicular blades narrowed into stout claws, rounded or truncate at the base; filaments subulate; follicles 5–6.5 mm. long.

TYPE LOCALITY: Northwest coast (of North America).
DISTRIBUTION: Coast and islands of western British America and Alaska.

2. **Leptasea chrysantha** (A. Gray) Small.

Saxifraga Hirculus A. Gray, Am. Jour. Sci. II. 33: 409. 1862. Not *S. Hirculus* L.
Saxifraga serpyllifolia A. Gray, Proc. Am. Acad. 6: 62. 1863. Not *S. serpyllifolia* Pursh.
Saxifraga chrysantha A. Gray, Proc. Am. Acad. 11: 83. 1877.

Leaves of the caudices similar to those of *L. serpyllifolia;* flower-stalks 2–5.5 cm. tall, sparingly glandular-pubescent or almost glabrous, bearing few essentially glabrous leaves; sepals ovate or oblong-ovate, 2–2.5 mm. long, somewhat glandular-ciliate, obtuse; petals golden-yellow, 6–7 mm. long, the oval or broadly obovate blades abruptly contracted into broad claws, truncate or subcordate at the base; filaments subulate.

TYPE LOCALITY: Rocky Mountains.
DISTRIBUTION: High mountains of Colorado.

3. **Leptasea alaskana** Small, sp. nov.

Leaves of the caudices 9–17 mm. long, the blades flat, elliptic, glabrous, obtuse, short-petioled; flower-stalks 3–5.5 cm. tall, shaggy-pubescent under the hypanthium, mostly 1-flowered; sepals broadly ovate, 2.5–3.5 mm. long, copiously ciliate, obtuse; petals yellow, 5.5–6.5 mm. long, the suborbicular blades narrowed into broad claw-like bases; filaments subulate.

Type collected thirty-five miles south of Pt. Barrow, Alaska, June 4, 1898, by E. A McIlhenny, *no. 73.*

4. **Leptasea Hirculus** (L.) Small.

Saxifraga Hirculus L. Sp. Pl. 402. 1753.
?*Saxifraga propinqua* R. Br.; Ross, Voy. 141. 1819.
Hirculus punctatus Raf. Fl. Tell. 2: 69. 1836.
Saxifraga Hirculus alpina Lange, Consp. Fl. Groenl. 64. 1880. Not *S. Hirculus alpina* Engler. 1872.

Leaves of the caudices 9–41 mm. long, the blades flat, elliptic or elliptic-spatulate, glabrous, obtuse, often long-petioled; flower-stalks 6–32 cm. tall, more or less pubescent, copiously so under the hypanthium, mostly 1-flowered; sepals oblong to oblong-ovate, 3–4 mm. long, copiously ciliate, obtuse, reflexed at maturity; petals elliptic to oblong, 9–13 mm. long, clawless; filaments subulate; follicles 12–16 mm. long.

TYPE LOCALITY: Switzerland.
DISTRIBUTION: Circumboreal and alpine, southward along the northwest coast to British Columbia and in the Rocky Mountains to Colorado.
ILLUSTRATIONS: Fl. Dan. 2: *pl. 260;* Curt. Fl. Lond. 2: *pl. 70;* Engl. Bot. 15: *pl. 1009;* Svensk Bot. *pl. 625,* Sturm, Deutsch. Fl. 9: *pl. 35;* Dietr. Fl. Bor. 9: *pl. 586;* Britt. & Brown, Ill. Fl. *f. 1825.*

5. **Leptasea aizoides** (L.) Haw. Saxifr. Enum. 40. 1821.

Saxifraga aizoides L. Sp. Pl. 403. 1753.

Leaves of the caudices 7–13 mm. long, the blades thick but flat, obtuse or acutish, glabrous or sparingly ciliate; flower-stalks 4–11 cm. tall, bearing larger leaves than the caudices, somewhat pubescent or almost glabrous, several-flowered, or rarely 1-flowered; sepals ovate, 2.5–4 mm. long, glabrous or essentially so; petals yellow, oblong, 3–4.5 mm. long, clawless; filaments subulate; follicles 6.5–8 mm. long.

TYPE LOCALITY: Sweden.
DISTRIBUTION: Mostly subalpine, alpine and circumboreal, on wet rocks, extending southward to Vermont, southwestern New York, and the Lake Superior region.
ILLUSTRATIONS: Engl. Bot. 1: *pl. 39;* Baxter, Brit. Bot. 3: *pl. 187;* Sternb. Rev. Saxifr. *pl. 7,* Sturm, Deutsch. Fl. 9: *pl. 35;* Schrank, Fl. Monac. 4: *pl. 337;* Britt. & Brown, Ill. Fl. *f. 1824.*

6. **Leptasea Van-Bruntiae** Small.

Saxifraga Van-Bruntiae Small, Bull. Torrey Club **25**: 316. 1898.

Leaves of the caudices 3.5–8.5 mm. long, the blades very thick, flattish, glabrous and eciliate, spine-tipped; flower-stalks 4–9 cm. tall, finely glandular-pubescent, bearing larger leaves than the caudices, several-flowered or 1-flowered; sepals ovate to oblong-ovate, 3–3.5 mm. long, glabrous, more or less eroded at the apex; petals deep-yellow, oblong, 4–4.5 mm. long, more or less eroded at the apex, clawless; filaments subulate; follicles 5.5–8 mm. long.

TYPE LOCALITY: Sulphur Mountain, near Banff, Alberta.
DISTRIBUTION: Rocky Mountains, British America.

7. **Leptasea cherlerioides** (D. Don) Small.

Saxifraga cherlerioides D. Don, Trans. Linn. Soc. **13**: 382. 1822.
Saxifraga bronchialis minor H. & A. Bot. Beech. Voy. 114. 1832.
Saxifraga Pseudo-Burserana Fisch.; T. & G. Fl. N. Am. 1: 565. 1840.
Saxifraga nitida Ledeb. Fl. Ross. **2**: 207. 1844. Not *S. nitida* DC. 1830.

Leaves of the caudices 2.5–4.5 mm. long, parchment-like, compactly crowded and converging into globular masses, the blades oblong to oblong-spatulate, spine-tipped, ciliate; flower-stalks 1–3.5 cm. tall, slender, finely glandular-pubescent, bearing few leaves, much smaller than those of the caudices; sepals ovate, 1–1.5 mm. long, sparingly ciliate, obtuse; petals white or whitish, oblong, 3 mm. long, clawless; filaments subulate; follicles 3–4 mm. long.

TYPE LOCALITY: Kamtschatka.
DISTRIBUTION: Mainland and islands in and about Bering Sea; also in northeastern Asia.

8. **Leptasea vespertina** Small, sp. nov.

Leaves of the caudices 4–11 mm. long, parchment-like, crowded, more or less spreading, the blades oblong to oblong-cuneate, spine-tipped, ciliate; flower-stalks 5.5–14 cm. tall, finely glandular-pubescent, bearing few leaves, which are smaller than those of the caudices; sepals ovate, 2–3 mm. long, obtuse, often glandular-ciliate; petals white and often yellow-spotted, oval to oval-ovate, 4.5–5.5 mm. long, clawless; filaments subulate; follicles 7–10 mm. long.

Type collected on Baldy Peak, Chehalis County, Washington, July 24, 1897, by Frank H. Lamb, *no. 1312.*
DISTRIBUTION: Alaska and the adjacent islands, British Columbia, Washington and Oregon.

9. **Leptasea austromontana** (Wiegand) Small.

Saxifraga bronchialis Pursh, Fl. Am. Sept. 310. 1814. Not *S. bronchialis* L. 1753.
Saxifraga austromontana Wiegand, Bull. Torrey Club **27**: 389. 1900.
Saxifraga cognata E. Nelson, Bot. Gaz. **30**: 118. 1900.

Leaves of the caudices 7–14 mm. long, or rarely somewhat shorter, parchment-like, crowded, but more or less spreading, the blades narrowly lanceolate to subulate, slenderly spine-tipped, ciliate; flower-stalks 8–15 cm. tall, glabrate or finely glandular-pubescent, bearing several leaves which are smaller than those of the caudices; sepals ovate, sometimes rather narrowly so, 1.5–3 mm. long, wholly glabrous or sparingly ciliate, obtuse; petals

white, often yellow-spotted, oblong to oblong-lanceolate, 5–6.5 mm. long, or rarely shorter, clawless; filaments subulate; follicles 5.5–9 mm. long.

TYPE LOCALITY: Cascade Mountains of Washington.
DISTRIBUTION: Alberta to British Columbia, Washington, Montana and New Mexico.

10. **Leptasea Funstonii** Small, sp. nov.

Leaves of the caudices 7–11 mm. long, parchment-like, crowded, more or less spreading, the blades linear to oblong-linear, spine-tipped, ciliate; flower-stalks 6–9 cm. tall, sparingly glandular-pubescent or glabrous, bearing several leaves which are smaller than those of the caudices; sepals ovate to ovate-lanceolate, 1.5–3 mm. long, glabrous, obtuse; petals white or yellow-tinged, usually yellow-spotted, 7–8 mm. long, with elliptic or oval blades and narrow claws ⅓ or ¼ as long as the blades; filaments subulate; follicles 8.5–9.5 mm. long.

Type collected at Disenchantment Bay, Alaska, August 5, 1892, by Frederick Funston, *no. 91.*
DISTRIBUTION: Coast of Alaska and adjacent islands.

11. **Leptasea tricuspidata** (Retz) Haw. Saxifr. Enum. 39. 1821.

Saxifraga tricuspidata Retz, Prodr. Fl. Scand. ed. 2. 104. 1795.
?*Saxifraga Chamissoi* Sternb. Rev. Saxifr. Suppl. 1: 12. 1822.

Leaves of the caudices 7.5–21 mm. long, parchment-like, crowded, spreading, the blades linear to cuneate-linear, ciliate, with 3 tooth-like lobes at the apex, each lobe spine-tipped; flower-stalks 5.5–18 cm. tall, sometimes sparingly glandular-pubescent, bearing several leaves which are much smaller than those of the caudices, and the upper ones, at least, entire; sepals ovate, 1.5–3 mm. long, obtuse, more or less ciliate; petals white, oblong-elliptic to oval, 6–7 mm. long, clawless; filaments subulate; follicles 5–6.5 mm. long.

TYPE LOCALITY: Scandinavia.
DISTRIBUTION: Greenland to the Bering Sea region and south to Labrador, Lake Superior and the Rocky Mountains of British America.
ILLUSTRATIONS: Fl. Dan. 6: *pl. 976;* Britt. & Brown, Ill. Fl. *f. 1828.*

12. **Leptasea flagellaris** (Willd.) Small.

Saxifraga flagellaris Willd.; Sternb. Rev. Saxifr. 25. 1810.
Saxifraga setigera Pursh, Fl. Am. Sept. 312. 1814.
Hirculus flagellaris Haw. Saxifr. Enum. 41. 1821.
Saxifraga flagellaris setigera Engler, Monogr. Saxifr. 225. 1872.

Leaves of the caudices 7–16 mm. long, crowded, more or less spreading, some of them subtending slender arching offsets, each of which bears a tuft of leaves at the apex, the blades cuneate, oblong-cuneate or spatulate, spine-tipped, glandular-ciliate; flower-stalks 4–15 cm. tall, glandular-pubescent, sometimes sparingly so near the base, 1–few-flowered; sepals ovate or oblong-ovate, 4–5.5 mm. long, glandular-ciliate, obtuse; petals yellow, cuneate or obovate, 6.5–9 mm. long, each abruptly contracted into a short claw; filaments subulate.

TYPE LOCALITY: Caucasus.
DISTRIBUTION: Circumboreal and alpine, extending southward in the Rocky Mountains to Arizona.
ILLUSTRATIONS: Sternb. Rev. Saxifr. *pl. 6;* Ledeb. Icon. *pl. 321;* Hook. Fl. Bor. Am. *pl. 87;* E. & P. Nat. Pfl. 3^{2a}: *f. 27, C.*

13. **Leptasea fimbriata** (D. Don) Small.

Saxifraga fimbriata D. Don, Trans. Linn. Soc. **13**: 404. 1822.
?*Saxifraga Eschscholtzii* Sternb. Rev. Saxifr. Suppl. 1: 9. 1822.

Leaves of the caudices 1.5–2 mm. long, densely imbricated, the blades obovate, often silvery-margined and conspicuously silvery-ciliate; flower-stalks 0.5–1 cm. long, leafless; sepals ovate or semiorbicular, 1–1.5 mm. long, ciliate at the apex, reflexed; petals wanting; filaments subulate; follicles 2–2.5 mm. long, the style-beaks about 0.5 mm. long.

TYPE LOCALITY: Cape Newnham, northwestern North America.
DISTRIBUTION: On rocks and in rocky soil, coast of western North America and adjacent islands, between latitudes 59° and 71°
ILLUSTRATION: E. & P. Nat. Pfl. 3^{2a}: *f. 27, D* (as *Saxifraga Eschscholtzii*).

14. **Leptasea Tolmiei** (T. & G.) Small.

Saxifraga Tolmiei T. & G. Fl. N. Am. 1: 567. 1840.

Leaves of the caudices 2–8 mm. long, approximate or crowded, the blades very thick or half-terete, oval or oblong, obtuse, glabrous; flower-stalks 3–9 cm. tall, sparingly glandular, at least above, leafless or nearly so, 1-flowered or sometimes few-flowered; sepals ovate, 2–2.5 mm. long, obtuse, glabrous; petals white, elliptic to spatulate, 5–5.5 mm. long; filaments clavate; follicles 9–11 mm. long.

TYPE LOCALITY: Northwest coast (of North America).
DISTRIBUTION: Washington and Oregon.

15. **Leptasea ledifolia** (Greene) Small.

Saxifraga ledifolia Greene, Pittonia 2: 101. 1890.

Leaves of the caudices 7–13 mm. long, approximate or somewhat crowded; the blades thick, often nearly half-terete, linear to oblong-linear, obtuse, glabrous; flower-stalks 7–12 cm. tall, finely glandular-pubescent above, leafless or nearly so, normally terminating in a corymb-like cyme; sepals ovate, 2–2.5 mm. long, glabrous, obtuse; petals white, elliptic to cuneate, 4–5.5 mm. long; filaments clavate; follicles 7–10 mm. long.

TYPE LOCALITY: Higher mountains above Truckee, California.
DISTRIBUTION: Oregon and California.

29. **OCREARIA** Small, gen. nov.

Perennial caulescent herbs, with somewhat leafy caudex-like stems, and naked flower-stalks (scapes). Leaves alternate, usually approximate; blades leathery-fleshy, palmately 3–9-lobed, long-petioled; stipules membranous-scarious, partially adnate to the petiole, sheathing the stem, at least when young. Flowers few, in terminal corymb-like cymes. Hypanthium flat-turbinate at maturity, slightly if at all accrescent. Sepals 5, triangular to lanceolate, erect. Corolla white, regular. Petals 5, mainly of an oblong type, narrowed into short claws. Stamens 10; filaments subulate. Ovary slightly inferior, the carpels united below the middle. Fruit erect. Follicles seated on the flattish hypanthium, erect or with the tips slightly spreading.

Type species, *Saxifraga nudicaulis* D. Don.

1. **Ocrearia nudicaulis** (D. Don) Small.

Saxifraga nudicaulis D. Don, Trans. Linn. Soc. 13: 366. 1822.
Saxifraga vaginalis Turcz.; Ledeb. Fl. Ross. 2: 220. 1844.

Plants 0.5–15 dm. tall, glabrous to the inflorescence or very sparingly pubescent; leaves usually approximate on the stems, the blades reniform, 1–2 cm. broad, broadly cuneate to cordate at the base, the lobes triangular to ovate, acute or apiculate; petioles usually slender, longer than the blades; stipules 4–7 mm. long, glandular-ciliate; scapes erect, corymbosely cymose at the top, the branches subtended by lobed or entire bracts; hypanthium 2.5–3 mm. broad at maturity; sepals triangular to lanceolate, 1.5–2.5 mm. long, 3-ribbed, acutish; petals 4–5 mm. long, the blades oblong or oblong-ovate, obtuse, 3–5-nerved, each narrowed into a short claw; fruit conic, 4.5–5.5 mm. high, the follicles mainly superior, with slightly spreading tips.

TYPE LOCALITY: West coast of North America.
DISTRIBUTION: Mainland and islands of Bering Sea.

30. **HETERISIA** Raf. (Fl. Tell. 2: 69. 1836, hyponym); Small.

Perennial caulescent herbs, the short caudex bearing several leaves, the flower-stalks sparingly leafy or scaly. Leaves alternate, but approximate; blades somewhat fleshy but thin in drying, palmately lobed, with the lobes typically 3-toothed, long-petioled; stipules thin-membranous, adnate to the lower part of the petiole, closely imbricated. Flowers few or many in panicled open cymules, sometimes all but the terminal ones replaced by clusters of bulblets. Hypanthium flat, scarcely accrescent. Sepals 5, ovate to oblong, strongly reflexed. Corolla white, regular. Petals 5, ovate above the narrow claw. Stamens 10;

filaments clavate. Ovary slightly inferior, the carpels united below the middle. Fruit nodding. Follicles seated on the flat hypanthium, the tips spreading or slightly recurved.

Type species, *Saxifraga Mertensiana* Bong.

Inflorescence bulblet-bearing: flowers di- or trimorphous. 1. *H. Mertensiana.*
Inflorescence not bulblet-bearing: flowers alike. 2. *H. Eastwoodiae.*

1. **Heterisia Mertensiana** (Bong.) Small.

Saxifraga Mertensiana Bong. Mem. Acad. St. Petersb. VI. **2**: 141. 1832.
Saxifraga heterantha Hook. Fl. Bor. Am. **1**: 252. 1832.
Steiranisia heterantha Raf. Fl. Tell. **2**: 69. 1836.

Leaves mainly ascending, 4.5–21 cm. long, the blades suborbicular to reniform, 2–6 cm. wide, shallowly lobed with the lobes usually broadly 3-toothed, deeply cordate at the base, glabrous or sparingly pubescent, shorter than the thinnish petioles; scapes 11–32 cm. tall, sparingly pubescent, bright-green, paniculately branched; cymules mainly reduced to bulblets along the slender peduncles, the terminal peduncles or the lateral ones terminating in a flower; sepals oblong to oblong-ovate, 2–3 mm. long, sometimes glandular-ciliolate, usually glabrous, reflexed; petals white, 3–4 mm. long, or rarely longer; follicles 4.5–5.5 mm. long.

TYPE LOCALITY: Sitka.
DISTRIBUTION: Alaska to Alberta, Montana and California.
ILLUSTRATION: Hook. Fl. Bor. Am. *pl. 78 b* as (*Saxifraga heterantha*).

2. **Heterisia Eastwoodiae** Small, sp. nov.

Leaves erect or ascending, 6–20 cm. long, the blades suborbicular, 2.5–8 cm. wide, deeply cordate at the base, shallowly several–many-lobed, commonly sparsely pubescent, shorter than the sparingly pubescent petioles; scapes 15–40 cm. tall, sparingly glandular-pubescent, pale-green, paniculately branched; cymules few-flowered, widely open, without bulblets; sepals oblong-ovate, becoming 2.5–3 mm. long; petals white, 4–5 mm. long; follicles 6.5–7.5 mm. long.

Type collected on the South fork of Smith River, Del Norte County, California, May 1, 1905, by Miss Alice Eastwood.
DISTRIBUTION: Washington to California.

31. **PELTIPHYLLUM** Engler, in E. & P. Nat. Pfl. 3^{2a}: 61. 1890.

Perennial, rather coarse acaulescent herbs, with stout rootstocks. Leaves alternate, all basal; blades suborbicular in outline, shallowly lobed and toothed, peltately terminating long petioles with broad stipular dilations at the base. Scapes surpassing the leaves. Flowers in terminal broad corymbose cymes. Hypanthium small, flattish, shorter than the calyx. Sepals 5, reflexed at maturity. Corolla white, regular. Petals 5, broad, clawless. Stamens 10; filaments subulate. Ovary slightly inferior, the carpels united only at the base. Follicles nearly distinct, more or less spreading. Seeds with a loose cellular coat.

Type species, *Saxifraga peltata* Torr.

1. **Peltiphyllum peltatum** (Torr.) Engler, in E. & P. Nat. Pfl. 3^{2a}: 61. 1890.

Saxifraga peltata Torr.; Benth. Pl. Hartw. 311. 1848.
Leptarrhena inundata Behr; Kellogg, Proc. Calif. Acad. 1: 45. 1855.

Rootstock fleshy; leaves tufted, 3–7 dm. tall, the petioles rough-glandular, the blades peltate, orbicular, 1–4 dm. broad, many-lobed, rather sharply and unequally toothed, glabrous or nearly so; scapes erect, simple below the inflorescence, with longer hairs than the petioles; sepals ovate to oval, 3–4 mm. long, obtuse, glandular-ciliate; petals ovate to oval, 6–7 mm. long, delicately veined, sessile; follicles 8–11 mm. long, more or less spreading.

TYPE LOCALITY: Sacramento Mountains.
DISTRIBUTION: Oregon and middle and northern California.

32. **ANTIPHYLLA** Haw. Saxifr. Enum. 43. 1821.

Perennial caulescent densely matted herbs, with copiously leafy stems and sterile branches, and naked or sparingly leafy flower-stalks. Leaves opposite, except sometimes on the flower-stalks, often 4-ranked, imbricated; blades relatively broad, conspicuously

ciliate, mostly with an almost apical pore, keeled, sessile. Flowers solitary, erect. Hypanthium shorter than the calyx. Sepals 5, strongly ciliate. Corolla regular, mostly blue or purple. Petals 5, much longer than the sepals, narrowed into claw-like bases. Filaments subulate to triangular. Ovary more than one-half superior, the carpels united to above the middle. Follicles erect, with more or less spreading tips. Seeds covered with hair-like papillae.

Type species, *Saxifraga oppositifolia* L.

Flower-stalks leafy; petals over 7.5 mm. long; filaments subulate or subulate-filiform. 1. *A. oppositifolia.*
Flower-stalks leafless; petals less than 6.5 mm. long; filaments triangular or lanceolate. 2. *A. pulvinata.*

1. **Antiphylla oppositifolia** (L.) Fourr. Ann. Soc. Linn. Lyons II. **16**: 386. 1868.

Saxifraga oppositifolia L. Sp. Pl. 402. 1753.
Antiphylla caerulea Haw. Saxifr. Enum. 43. 1821.
Antiphylla spatulata arctica Haw. Saxifr. Enum. 45. 1821.
Saxifraga oppositifolia albiflora Lange, Consp. Fl. Groenl. 66. 1880.

Plants in dense mats; leaves densely imbricated except on the flower-stalks and sometimes on elongated stems, 4-ranked, the blades obovate to spatulate, 3–5 mm. long, ciliate, keeled; flower-stalks 1–3 cm. long or sometimes shorter when young, leafy; hypanthium somewhat ribbed; sepals oblong to ovate, 2.5–3 mm. long, ciliate all around; petals lilac or purple, elliptic to oval, 8–9 mm. long, or perhaps somewhat shorter in diminutive specimens, each narrowed into a stout claw-like base; filaments subulate or subulate-filiform; follicles 8–9 mm. long, the style-tips fully 2 mm. long.

TYPE LOCALITY: Lapland.
DISTRIBUTION: On rocks and in stony soil, alpine and circumboreal, extending southward to the high mountains of northern Vermont and British Columbia.
ILLUSTRATIONS: L. Fl. Lapp. *pl. 2;* All. Fl. Ped. 3: *pl. 21, f. 1;* Fl. Dan. 1: *pl. 34;* Curt. Fl. Lond. 1: *pl. 4;* Engl. Bot. 1: *pl. 9;* Lodd. Cab. *pl. 869;* Sweet, Br. Bot. *pl. 9;* Britt. & Brown, Ill. Fl. *f. 1323;* (all as *Saxifraga oppositifolia*).

2. **Antiphylla pulvinata** Small.

Saxifraga pulvinata Small, Bull. N. Y. Bot. Gard. **2**: 172. 1901.

Plants in depressed mats; leaves densely imbricated, 4-ranked; the blades obovate, cuneate or rhombic, 1.5–3.5 mm. long, keeled, ciliate; flower-stalk 0.5–1 cm. long, leafless; hypanthium prominently and sharply ribbed; sepals oblong or ovate-oblong, ciliate all around; petals rose-purple, oval-elliptic, 6 mm. long, each narrowed into a short claw-like base; filaments lanceolate or triangular; follicles 7 mm. long, the style-tips 2–3 mm. long.

TYPE LOCALITY: Lake Bennett, Yukon District.
DISTRIBUTION: In dense tufts on the higher summits about Lake Bennett.

33. **ASTILBE** Hamilt.; D. Don, Prodr. Fl. Nepal. 210. 1825.

Perennial caulescent large herbs, resembling *Aruncus*. Leaves alternate; blades thrice compound, the leaflets numerous, their blades broadest below the middle, toothed, the terminal one 3-lobed. Flowers very numerous, usually polygamo-dioecious, in terminal panicled spikes or racemes. Hypanthium about as long as the calyx. Sepals 5 or rarely 4, erect. Corolla whitish, or yellowish-white, or wanting. Petals 5, or rarely 4, long and narrow. Stamens 10; filaments filiform, elongated. Ovary slightly adnate to the hypanthium, the two or three carpels united at the base, the placentae axial. Follicles erect, nearly distinct. Seeds with the loose testa tapering at both ends.

Type species, *Astilbe rivularis* D. Don.

Leaflets with sharply toothed, or lobed, blades; follicles 4 mm. high. 1. *A. biternata.*
Leaflets with crenately toothed, or lobed, blades; follicles 3 mm. high. 2. *A. crenatiloba.*

1. **Astilbe biternata** (Vent.) Britton, Bull. Torrey Club **20**: 475. 1893.

Spiraea Aruncus hermaphrodita Michx. Fl. Bor. Am. 1: 294. 1803.
Tiarella biternata Vent. Jard. Malm. 54. 1805.
Astilbe decandra D. Don, Prodr. Fl. Nepal. 211. 1825.
Blondia biternata Raf. Fl. Tell. **2**: 75. 1836.

Stem 1–2 m. tall, branched or sometimes simple; leaflets sparingly appressed-pubescent beneath, acuminate, the lateral ones ovate, oblong-ovate, ovate-lanceolate or oblong, sharply serrate or incised, terminal one oval or suborbicular in outline, sharply 3-lobed; panicle 1–3 dm. long, finely glandular-pubescent; sepals broadly ovate, becoming oblong, at maturity longer than the hypanthium; petals linear-spatulate, 2.5–4 mm. long, or obsolete in perfect flowers; fruit conic, the follicles 4–5 mm. long.

TYPE LOCALITY: North America.
DISTRIBUTION: Virginia to Tennessee and Georgia.
ILLUSTRATIONS: Vent. Jard. Malm. *pl. 54* (as *Tiarella biternata*); Britt. & Brown, Ill. Fl. *f. 1822*.

2. **Astilbe crenatiloba** (Britton) Small.

Astilbe decandra crenatiloba Britton, Bull. Torrey Club **15**: 98. 1888.
Astilbe biternata crenatiloba Wheelock, Bull. Torrey Club **23**: 68. 1896.

Stem about 1 m. tall, more or less branched; leaflets glabrous or nearly so, not acuminate, the lateral ones ovate to oval or oblong-oval, bluntly lobed and crenate with mucronate-tipped teeth, the terminal one broader and larger than the lateral, equally 3-lobed; panicle broad; flowers nearly like those of *A. biternata*; fruit ovoid, the follicles 3 mm. long.

TYPE LOCALITY: Slope of Roan Mountain, eastern Tennessee.
DISTRIBUTION: On shaded slopes, Roan Mountain, North Carolina and Tennessee.

Family 6. **HYDRANGEACEAE**

By John Kunkel Small and Per Axel Rydberg

Shrubs or trees, or sometimes vines. Leaves opposite, without stipules, sometimes persistent; blades simple, entire or toothed. Flowers commonly perfect, in raceme-like, corymb-like, or panicled cymes, those at the margins of the cyme sometimes sterile and conspicuously enlarged. Calyx of mostly 4–10 sepals surmounting the often ribbed hypanthium, in sterile flowers often conspicuously enlarged. Corolla of 4–10 petals, the petals valvate, imbricate or convolute in the bud. Androecium of 8–many stamens. Filaments subulate to linear, or flattened, sometimes appendaged. Gynoecium of 2–5, or rarely 10, united carpels. Ovary wholly or partially inferior. Styles distinct or united, usually persistent, sometimes wanting. Stigmas terminal or introrse. Ovules few or numerous, anatropous. Fruit capsular, urceolate to conic, or rarely spheroidal, sometimes opening through the sides. Seeds solitary or numerous.

Genera *Hydrangea*, *Cornidia*, *Neodeutzia*, *Decumaria*, *Edwinia*, *Fendlerella*, *Fendlera*, *Carpenteria* and *Whipplea* by J. K. Small.

Genus *Philadelphus* by P. A. Rydberg.

Capsule urceolate to conic or ovoid; style or stigma persistent, the capsule thus beaked.
  Capsule urceolate or obovoid, the beak or beaks arising abruptly from the body.
    Sepals and petals 5 or fewer; styles and stigmas mostly distinct; stigmas when united elongated.
      Petals valvate; stamens 8–10; corolla relatively small.
        Styles wanting; stigmas introrse; mature hypanthium ribbed. 1. Hydrangea.
        Styles subulate; stigmas nearly terminal; mature hypanthium angled. 2. Cornidia.
      Petals convolute or imbricate; stamens 12–20, or more; corolla relatively large.
        Capsule, and mature hypanthium, subglobose; petals imbricate. 3. Neodeutzia.
        Capsule, and mature hypanthium, obovoid or obconic; petals convolute. 4. Philadelphus.
    Sepals and petals 7 or more; styles united; stigma depressed. 5. Decumaria.
  Capsule conic or ovoid, the beak or beaks arising gradually from the body.
    Stamens 15 or fewer; styles 3–5, distinct.
      Filaments unappendaged; sepals, and petals, 5; anthers not appendaged at the top.
        Leaf-blades toothed; hypanthium short during anthesis. 6. Edwinia.
        Leaf-blades entire; hypanthium long during anthesis. 7. Fendlerella.
      Filaments appendaged under the anthers; sepals, and petals, 4; anthers appendaged at the top. 8. Fendlera.
    Stamens 20 or more; styles united; stigmas 5–7. 9. Carpenteria.
Capsule spheroidal; style deciduous, the capsule thus beakless. 10. Whipplea.

1. **HYDRANGEA** (Gron.) L. Sp. Pl. 397. 1753.

Shrubs. Leaves opposite, deciduous or persistent; blades decidedly toothed or lobed. Flowers perfect, except some of the marginal ones of the cymes or cymules, the cymes corymb-like or thyrsoid, not subtended by an involucre. Sepals 4 or 5, often minute, or in the sterile flowers 4 or 5 spreading petal-like lobes. Petals 4 or 5, valvate. Stamens 8–10; filaments filiform or nearly so; anthers didymous. Ovary inferior, completely or partially 2–4-celled; styles wanting; stigmas 2–4, distinct, introrse. Ovules numerous, borne on axial placentae. Capsule 2–4-celled, membranous-walled, opening at the top between the curving stigmas. Seeds numerous, minute.

Type species, *Hydrangea arborescens* L.

Leaf-blades merely toothed; inflorescence corymb-like.
  Leaf-blades glabrous, or inconspicuously pubescent beneath with scattered hairs. 1. *H. arborescens.*
  Leaf-blades densely pubescent beneath with gray or white hairs.
    Leaf-blades membranous, the lower surface tomentose, gray. 2. *H. cinerea.*
    Leaf-blades leathery, the lower surface felty, white. 3. *H. radiata.*
Leaf-blades deeply lobed, the lobes toothed; inflorescence thyrsoid. 4. *H. quercifolia.*

1. **Hydrangea arborescens** L. Sp. Pl. 397. 1753.

Hydrangea frutescens Marsh. Arbust. 61. 1785.
Hydrangea viburnifolia Salisb. Prodr. 284. 1796.
Hydrangea vulgaris Michx. Fl. Bor. Am. 1: 268. 1803.
Hydrangea cordata Pursh, Fl. Am. Sept. 309. 1814.
Hydrangea vulgaris cordata Torr. Ann. Lyc. N. Y. 2: 205. 1827.
Hydrangea vulgaris carnea Raf. New Fl. 3: 77. 1836.
Hydrangea acuta Raf. New Fl. 3: 77. 1836.
Hydrangea glauca Raf. New Fl. 3: 77. 1836.
Hydrangea rotundifolia Raf. New Fl. 3: 78. 1836.
Hydrangea heterophylla Raf. New Fl. 3: 78. 1836.
Hydrangea amplifolia Raf. New Fl. 3: 78. 1836.
Hydrangea arborescens kanawhana Millsp. Bull. W. Va. Agric. Exp. Sta. 2: 363. 1891.

A branching, sometimes straggling shrub, 1–3 m. tall, the twigs and branches of the inflorescence sparingly pubescent; leaf-blades ovate, oval or elliptic, 0.5–2 dm. long, short-acuminate at the apex, serrate, acute, rounded or cordate at the base, glabrous or sometimes minutely pubescent beneath; petioles shorter than the blades; cymes 5–20 cm. broad, usually with few ray-flowers; hypanthium 2–3 mm. wide at maturity; sepals minute, triangular; petals deciduous, concave, ovate, 1–1.5 mm. long; capsule-body 2–2.5 mm. high, prominently ribbed, broader than high.

TYPE LOCALITY: Virginia.
DISTRIBUTION: New York to Iowa, Florida and Louisiana.
ILLUSTRATIONS: Lam. Tab. Encyc. *pl. 370, f. 1,* Bot. Mag. *pl. 437;* Wats. Dendr. *pl. 42* (as *H. cordata*); Loud. Arb. *f. 748* and *749;* Britt. & Brown, Ill. Fl. *f. 1858.*

2. **Hydrangea cinerea** Small, Bull. Torrey Club **25**: 148. 1898.

A spreading shrub, 1–2 m. tall, the twigs and branches of the inflorescence copiously or densely pubescent; leaf-blades oval, elliptic, narrowly ovate or orbicular-ovate, 6–15 cm. long, short-acuminate at the apex, serrate, obtuse, rounded or cordate at the base, bright-green above, gray-tomentose and not prominently reticulated beneath; petioles sometimes more than one-half as long as the blades; cymes 5–22 cm. broad, rather round-topped; ray-flowers commonly present, but rarely numerous; hypanthium about 2 mm. wide at maturity; sepals triangular, acute; petals 5, ovate, boat-shaped, 1.5–2 mm. long; capsule-body 2–2.5 mm. high, usually higher than broad, strongly ribbed.

TYPE LOCALITY: Alleghany Mountains, Tennessee and Georgia.
DISTRIBUTION: Alleghanies, North Carolina, Tennessee, Georgia and Alabama.

3. **Hydrangea radiata** Walt. Fl. Car. 251. 1788.

Hydrangea nivea Michx. Fl. Bor. Am. 1: 268. 1803.
Hydrangea discolor Raf. New Fl. 3: 79. 1836.

A branching shrub, 1–2.5 m. tall, the twigs and inflorescence-branches finely pubescent; leaf-blades ovate, varying to oval or ovate-lanceolate, 6–12 cm. long, longer-acuminate at the apex than in *Hydrangea cinerea*, serrate or crenate-serrate, acute, rounded or subcordate at the base, bright-green and glabrous above, densely silvery white-tomentose and usually conspicuously reticulated beneath; petioles usually half as long as the blades or shorter; cyme round-topped, 4–12 cm. broad; ray-flowers always present and sometimes numerous; hypanthium about 2.5 mm. wide at maturity, prominently ribbed; sepals triangular or usually somewhat acuminate; petals 5, ovate, concave, 1–1.5 mm. long, apiculate; capsule-body fully 2 mm. high.

TYPE LOCALITY: Carolina.
DISTRIBUTION: In or near the mountains, North Carolina and South Carolina.
ILLUSTRATIONS: Lam. Tab. Encyc. *pl. 307, f. 2;* Loud. Arb. *f. 750* (as *H. nivea*); Britt. & Brown, Ill. Fl. *f. 1859.*

4. **Hydrangea quercifolia** Bartr. Trav. 380. 1794.

Hydrangea radiata Smith, Icon. Pict. 1 : 12. 1792. Not *H. radiata* Walt. 1788.
Hydrangea angulata Bausch, Flora 17 : 494. 1834.
Hydrangea quinquefolia D. Dietr. Syn. Pl. 2 : 1525. 1840.

A stout shrub, 1–2 m. tall, the twigs and other young parts densely reddish-tomentose and usually with an additional coating of white arachnoid hairs ; leaf-blades oval, ovate or suborbicular in outline, usually 5-lobed, 6–20 cm. long, tomentose or arachnoid beneath, the lobes serrate and often slightly lobed ; petioles much shorter than the blades ; thyrsoid cyme 1–3 dm. long ; ray-flowers numerous, white, turning purple ; hypanthium 3–3.5 mm. wide at maturity, finely ribbed ; sepals ovate, obtuse ; petals 5, oblong, 1.5–2 mm. long, slightly concave ; capsule-body about 3 mm. high.

TYPE LOCALITY : Georgia (in what is now Crawford County).
DISTRIBUTION : Georgia and Florida to Mississippi.
ILLUSTRATIONS : Bartr. Trav. *pl. 7* ; Bot. Mag. *pl. 975* ; Nouv. Duham. *pl. 78* ; Audubon, Birds, *pl. 119* ; Loud. Arb. *pl. 751* ; E. & P. Nat. Pfl. 3^{2a} : *f. 40*.

2. **CORNIDIA** R. & P. Syst. Fl. Peru. & Chil. 91. 1798.

Sarcostyles Presl, Reliq. Haenk. 2 : 53. 1831.

Trees, shrubs or vines. Leaves opposite, persistent ; blades entire or shallowly and remotely toothed. Flowers perfect, borne in a corymb-like or elongated cyme, the cyme or cymules subtended by a deciduous 4-bracted involucre. Sepals 4, very short, much wider than long. Petals 4, valvate. Stamens 8 ; filaments subulate or filiform ; anthers oblong to ovoid. Ovary inferior, 3–4-celled ; styles 3 or 4, subulate, cohering and erect, but becoming distinct and spreading ; stigmas minute, nearly terminal. Ovules numerous, borne on axial placentae. Capsule 3–4-celled, opening at the top between the diverging styles, thick-walled. Seeds numerous, minute.

Type species, *Cornidia umbellata* R. & P.

1. **Cornidia peruviana** (Moric.) Small.

Hydrangea peruviana Moric.; DC. Prodr. 4 : 14. 1830.
Sarcostyles peruviana Presl, Reliq. Haenk. 2 : 54. 1831.
Cornidia radiata Oerst. Vidensk. Meddel. 1856 : 42. 1856.

Young branches, leaves and inflorescence tomentose or tomentulose, the pubescence sometimes nearly or quite deciduous ; leaf-blades leathery, oblong or elliptic, varying to obovate or ovate, 8–21 cm. long, abruptly pointed or short-acuminate, more or less distinctly serrulate or denticulate, finely reticulated at least beneath, short-petioled ; primary branches of the cyme borne umbellately on the enlarged top of the flowering branch, much divided, and usually bearing long-stalked ray-flowers on the ultimate divisions ; sepals very broad, about 0.5 mm. high ; petals ovate to lanceolate-ovate, 2.5–3 mm. long ; capsules 2.5–3 mm. wide, the body broader than high.

TYPE LOCALITY : Peru.
DISTRIBUTION : Mexico, through Central America to Peru and Chile.
ILLUSTRATION : Presl, Reliq. Haenk. 2 : *pl. 60*.

3. **NEODEUTZIA** Small, gen. nov.

Shrubs. Leaves opposite, deciduous ; blades toothed. Flowers perfect, in terminal corymb-like cymes. Hypanthium hemispheric, becoming depressed in age and lobed, not ribbed. Sepals 5, about as long as the hypanthium, reflexed or erect. Petals white, 5, not narrowed into claws. Stamens 12–15 ; filaments subulate, toothless, narrowed from the base to the apex ; anthers didymous. Ovary inferior, 3–5-celled ; styles 3–5, distinct, elongated ; stigmas introrse. Ovules numerous in each ovary-cavity. Capsule 3–5-celled, rather woody, mainly opening at the base of the styles. Seeds numerous.

Type species, *Deutzia mexicana* Hemsl.

Corolla 11–14.5 mm.wide ; petals obovate, 5–6 mm. long. 1. *N. mexicana*.
Corolla 7–9 mm. wide ; petals orbicular-ovate, 3–4 mm. long. 2. *N. ovalis*.

1. **Neodeutzia mexicana** (Hemsl.) Small.

Deutzia mexicana Hemsl. Diag. Pl. Nov. 9. 1878.

A shrub 2–5 m. tall, the bark pale, the twigs scurfy; leaf-blades thickish, lanceolate to ovate-lanceolate, 2.5–6 cm. long, rather closely but finely serrate or serrate-dentate, acute, tomentulose above, densely pale or whitish pubescent beneath, mainly rounded at the base; buds about 4 mm. long just before anthesis; sepals broadly ovate, about 2 mm. long during anthesis and reflexed; petals obovate, 5–6 mm. long; filaments 3–3.5 mm. long; capsules 4.5–5.5 mm. wide, crowned with the reflexed sepals.

TYPE LOCALITY: Orizaba, Mexico.
DISTRIBUTION: Mexico.
ILLUSTRATION: Hemsl. Biol. Cent. Am. Bot. *pl. 18* (as *Deutzia mexicana*).

2. **Neodeutzia ovalis** Small, sp. nov.

A shrub, usually lower, and smaller in all its parts, than *Neodeutzia mexicana;* leaf-blades oval or broadly oblong to ovate-oval, 1.5–2.5 cm. long, remotely denticulate, scabro-pubescent above, canescent-scurfy beneath with white hairs, acute or acutish at the base; buds about 3 mm. long just before anthesis; sepals triangular, about 1.5 mm. long during anthesis and spreading or ascending; petals orbicular-ovate, 3–4 mm. long; filaments 2–2.5 mm. long; capsules not seen.

Type collected at San José Pass, San Luis Potosi, July 22, 1890, by C. G. Pringle, *no. 3216.*
DISTRIBUTION: Mexico.

4. **PHILADELPHUS** L. Sp. Pl. 470. 1753.

Syringa Adans. Fam. **2**: 244. 1763.

Branching shrubs. Leaves opposite, deciduous or partly persistent; blades toothed or entire. Flowers perfect, often fragrant, borne at the end of short leafy branches, solitary or in small 3–9-flowered cymes, or forming false racemes or panicles. Sepals 4, rarely 5, valvate, persistent, ovate to lanceolate, more or less tomentulose within at least along the margins. Petals 4, rarely 5, convolute, white or ochroleucous, conspicuous, in most species rounded or retuse at the apex. Stamens usually many, 25–60, but in one species only about 15; filaments flat, subulate, free or more or less united below; anthers short, more or less didymous. Ovary at least two thirds inferior and adnate to the hypanthium, 4-celled, or rarely 3- or 5-celled; styles from elongated and equaling the stamens to almost none, from nearly distinct to united to the apex; stigmas distinct, and then often broadened and obovate or narrower and clavate, or more or less united or coherent, and then linear or oblong. Ovules numerous, pendulous, multiserial and imbricated. Capsule obovoid, more or less woody or leathery, loculicidal and the septa separating in the center; seeds numerous, with membranous reticulated testa and fimbriate umbilicus; albumen fleshy.

Type species, *Philadelphus coronarius* L.

I. Styles and upper free part of the ovary both glabrous.
  A. Flowers 5–40, in raceme-like or paniculate flower-clusters; stigmas clavate, usually narrower than the anthers.
    1. Flower-clusters paniculate, 10–40-flowered; styles wholly united and stigmas sometimes partly so. (CALIFORNICI.)
      Leaf-blades broad, usually broadly ovate or subcordate, mucronate-denticulate; sepals acute or rarely short-acuminate. — 1. *P. cordifolius.*
      Leaf-blades (except on young shoots) narrower, ovate to lance-ovate; sepals acuminate.
        Leaf-blades glabrous or nearly so beneath, entire or minutely denticulate. — 2. *P. californicus.*
        Leaf-blades hirsute-strigose beneath, especially towards the base, usually dentate. — 3. *P. Fremontii.*
    2. Flower-clusters racemose, 5–9-flowered; upper part of the styles free. (CORONARII.)
      Bark of the previous season's growth red or chestnut-brown, either exfoliating in large sheets, or with conspicuous cross-cracks and peeling off sooner or later.
        Leaf-blades with numerous teeth; flowers very fragrant; petals cream-colored; bark readily exfoliating; introduced species. — 4. *P. coronarius.*

Leaf-blades entire or denticulate with very few teeth ; flowers not very fragrant ; petals white ; native western species.
Leaf-blades ovate-lanceolate or ovate ; the strongest lateral veins meeting the mid-rib some distance from the base of the leaf-blade. 5. *P. Lewisii.*
Leaf-blades narrowly lanceolate; the strongest lateral veins originating at the base of the leaf-blade. 6. *P. angustifolius.*
Bark of the previous season's growth gray or yellowish, rarely if at all exfoliating.
Hypanthium and calyx glabrous or nearly so.
Bark of the young twigs reddish or yellowish ; western species.
Petals ovate-lanceolate, acutish or obtuse at the apex. 7. *P. Helleri.*
Petals oblong to round-oval, rounded or retuse at the apex.
Leaf-blades thick, lanceolate to ovate-lanceolate, sparingly denticulate or entire, 3-ribbed, or if 5-ribbed, the second, stronger, pair of laterals meeting the mid-rib some distance fromthe base ; capsule elongated-obovoid. 8. *P. columbianus.*
Leaf-blades thin, usually broadly ovate or oval, 5-ribbed and all five ribs originating at the base of the leaf-blade.
Sepals broadly ovate, acute ; capsule almost as broad as long ; leaf-blades only sparingly hairy, sparingly denticulate or entire. 9. *P. confusus.*
Sepals lance-ovate ; capsule decidedly longer than broad ; leaf-blades densely hairy at least in the axils of the veins beneath, usually coarsely dentate.
Sepals lance-ovate, abruptly acuminate. 10. *P. Gordonianus.*
Sepals lanceolate, acute. 11. *P. platyphyllus.*
Bark of the young twigs light-gray ; eastern species. 12. *P. intectus.*
Hypanthium and calyx densely hairy. 13. *P. latifolius.*

B. Flowers 1–3, or sometimes 4–9, but then in true cymes.
1. Leaf-blades thin, not leathery, usually over 3 cm. long, most commonly more or less dentate or denticulate.
Stigmas and a part of the styles distinct, the former broader than the anthers; winter-buds enclosed in the bases of the petioles. (GRANDIFLORI.)
Pedicels, hypanthium and calyx externally glabrous, or the latter somewhat pubescent in No. 15.
Base of the capsule gradually attenuate into the pedicel.
Sepals acute ; leaf-blades remotely denticulate or entire.
Leaf-blades sparingly hairy or glabrate ; sepals glabrous. 14. *P. inodorus.*
Leaf-blades densely strigose beneath ; sepals usually somewhat hairy. 15. *P. strigosus.*
Sepals acuminate ; leaf-blades sharply and remotely dentate. 16. *P. grandiflorus.*
Base of the capsule abruptly contracted, the pedicel therefore sharply differentiated. 17. *P. gloriosus.*
Pedicels, hypanthium and calyx externally conspicuously hairy. 18. *P. speciosus.*
Stigmas (at least partly) and styles united ; the former linear ; winter-buds not enclosed in the bases of the petioles. (HIRSUTI.) 19. *P. hirsutus.*
2. Leaf-blades small, 0.5–2 cm. (rarely 3 cm.) long, more or less leathery, entire ; styles usually wholly united (except in two species), and stigmas often partly so. (MICROPHYLLI.)
Petals rounded or retuse at the apex : stamens 25–60.
Bark of the previous season's growth not exfoliating. 25. *P. asperifolius.*
Bark of the previous season's growth exfoliating.
Hypanthium and calyx densely pubescent, silvery white.
Lower surface of the leaf-blades silvery white.
Leaf-blades hirsute ; calyx and hypanthium white-villous. 26. *P. argyrocalyx.*
Leaf-blades strigose ; calyx and hypanthium white-strigose. 27. *P. argenteus.*
Lower surface of the leaf-blades only slightly paler than the upper, strigose. 28. *P. ellipticus.*
Hypanthium and calyx externally strigose or glabrous, not silvery white.
Leaf-blades strigose on both sides ; petals white.
Hypanthium 4–5 mm. long.
Leaf-blades equally grayish on both sides ; sepals acute ; bark of the old stems straw-colored. 29. *P. stramineus.*
Leaf-blades paler beneath ; sepals acuminate ; bark of the old stems gray. 30. *P. microphyllus.*

Hypanthium about 2 mm. long, or in fruit 3–4 mm. long.
Styles wholly united or nearly so; stigmas also often partly united; leaf-blades oblong or elliptic-ovate, sparingly strigose, acute. 31. *P. occidentalis.*
Styles distinct above for one half to one third their length; stigmas distinct.
Leaf-blades oblong or elliptic, obtuse or acutish, shining above, sparingly strigose on both sides or glabrate above; stigmas clavate. 32. *P. minutus.*
Leaf-blades lanceolate, acute, dull, densely strigose beneath; stigmas linear-oblong. 33. *P. Palmeri.*
Leaf-blades short-hispid above, white-strigose and tomentulose beneath; petals ochroleucous.
Pistil equaling the stamens; styles evident; bark of the older stems straw-colored, only in age somewhat grayish. 34. *P. pumilus.*
Pistil shorter than the stamens; styles almost none; bark of the older stems dark-gray. 35. *P. serpyllifolius.*
Petals acute at the apex, ochroleucous; stamens about 15. 36. *P. Mearnsii.*

II. Styles or upper free part of the ovary, or both, more or less hairy. (MEXICANI.)
Inflorescence 1–3 flowered.
Leaf-blades 2–7 cm. long, usually more or less toothed; petals more or less hairy.
Petals densely hairy on both sides. 20. *P. myrtoides.*
Petals only sparingly pubescent and only at the base or along the middle line externally.
Hypanthium and calyx sparingly strigose; petals without reddish spot at the base. 21. *P. mexicanus.*
Hypanthium and calyx densely silvery-pubescent; petals with a reddish spot at the base. 22. *P. Coulteri.*
Leaf-blades 0.5–1.5 cm. long, entire; petals glabrous. 27. *P. argenteus.*
Inflorescence 5–13-flowered; petals glabrous, or pubescent along the mid-rib below.
Buds hidden in the bases of the petioles; leaf-blades hirsute above. 8. *P. columbianus.*
Buds not hidden in the bases of the petioles; leaf-blades strigose.
Twigs grayish-strigose; leaf-blades more or less strigose on both sides. 23. *P. Karwinskyanus.*
Twigs and leaf-blades glabrous or the latter hairy along the veins. 24. *P. affinis.*

1. **Philadelphus cordifolius** Lange, Fort. Landboh. Fril. 66. 1871.—Bot. Tidsskr. III. 2: 132. 1878.

A rather tall shrub, 2 m. or more high, with ascending or spreading branches; bark of the young twigs cinnamon-brown, glabrous, shining, of the previous season's growth darker brown and exfoliating, and of the older stems light-gray; buds enclosed in the bases of the petioles; peticles 1–1.5 cm. long; leaf-blades usually broadly ovate, short-acuminate or acute at the apex, rounded at the base, sometimes rounded-ovate or subcordate or those subtending the flower clusters lance-ovate, mucronate-denticulate, glabrous or pubescent in the axils of the veins beneath, dark-green above, paler beneath, 5–10 cm. long, 5–7-ribbed; flowering branches 1–4 dm. long, with 2–5 pairs of leaves and a rather dense panicle of 15–40 flowers, the lower branches of the inflorescence often subtended by leaves; hypanthium glabrous; sepals lance-ovate, acute or rarely short-acuminate, about 5 mm. long, glabrous without, silky-tomentulose within; petals oval, usually emarginate, 10–12 mm. long; stamens numerous; styles united to the apex; stigmas clavate, smaller than the anthers; capsule obovoid, 7–8 mm. long.

TYPE LOCALITY: Described from cultivated specimens from California.
DISTRIBUTION: California, on the western slope of the Sierra Nevada.
ILLUSTRATION: Bot. Tidsskr. III. 2: *pl. 3.*

2. **Philadelphus californicus** Benth. Pl. Hartw. 309. 1849.

Philadelphus Lewisii californicus A. Gray, Bot. Calif. 1: 202. 1876.

A deciduous shrub, 2–3 m. high, with ascending branches; bark of the young twigs reddish, glabrous, of the previous season's growth red or chestnut, exfoliating, and that of the old stems gray; buds scarcely enclosed in the bases of the petioles; petioles about 1 cm. long, grooved above; leaf-blades ovate or lance-ovate, acute at both ends, entire or minutely denticulate, 3–8 cm. long, glabrous or nearly so, 3–5-ribbed, the ribs originating at the

bases of the leaf-blades; flowering branches 1–2 dm. long, with 2–4 pairs of leaves and a panicle of 7–20 inodorous flowers; hypanthium glabrous; sepals ovate, acuminate, glabrous without, tomentose on the margin within, about 5 mm. long; petals white, oval or obovate, rounded at the apex, about 1 cm. long; stamens numerous; styles united to the apex; stigmas short-clavate, almost as thick as the anthers; capsule short-obovoid, about 8 mm. long.

TYPE LOCALITY: Mountains of the Sacramento, California.
DISTRIBUTION: California, on the western slope of the Sierra Nevada.

3. **Philadelphus Fremontii** Rydb. sp. nov.

A deciduous shrub, 3–4 dm. high, with ascending branches; bark of young twigs more or less chestnut-brown, of the previous season's growth also chestnut and exfoliating, and of the old stems gray; bud-scales not enclosed in the bases of the petioles; petioles about 5 mm. long, hairy; ordinary leaf-blades ovate or lance-ovate, acute or short-acuminate at the apex, usually acute at the base, more or less dentate, sparingly hairy on both sides and densely so in the axils of the veins beneath, 3–5-ribbed, 3–6 cm. long; those on young vigorous shoots broadly ovate or subcordate, coarsely toothed, and rather densely pubescent all over; flowering branches 1–2 dm. long, with 2–4 pairs of leaves and a panicle of 9–20 flowers; hypanthium glabrous; sepals ovate, acuminate, about 6 mm. long, glabrous without, tomentose within; petals oblong to oval, about 12 mm. long; stamens many; styles united to the apex; stigmas clavate; capsule obovate, 8–9 mm. long.

Type collected on the north fork of the American River, in 1846, by J. C. Frémont, *no. 511.*
DISTRIBUTION: Northern California.

4. **Philadelphus coronarius** L. Sp. Pl. 470. 1753.

Syringa suaveolens Moench, Meth. Pl. 678. 1794.

A shrub 2–4 m. high with erect or ascending branches; bark of the young twigs brown or yellowish, glabrous or nearly so, of the previous season's growth chestnut-brown and exfoliating, and of the old stems gray; buds enclosed in the bases of the petioles; petioles 5–10 mm. long; leaf-blades ovate, elliptic-ovate or oval, usually acute at both ends, denticulate, 3–10 cm. long, thin, glabrous except the veins and the axils of the veins beneath; flowering branches 5–15 cm. long, with 2 or 3 pairs of leaves and 5–9 very fragrant, racemosely disposed flowers; hypanthium glabrous or pubescent; sepals lance-ovate, about 7 mm. long, acute; petals cream-colored, obovate, 12–15 mm. long; stamens numerous; styles from distinct to united two-thirds their length; stigmas half as wide as the anthers or narrower; capsule obovoid, about 7 mm. long.

TYPE LOCALITY: Unknown.
DISTRIBUTION: From Switzerland, Bohemia and southern Russia to Caucasus and Armenia; cultivated and escaped in the Eastern States.
ILLUSTRATIONS: Loud. Arb. *f. 673;* Bot. Mag. *pl. 391;* Schkuhr, Handb. *pl. 131a;* Sturm, Deutsch. Fl. I. 3: *pl. 11;* Fl. Deutsch. ed. 5. *pl. 2190.*

5. **Philadelphus Lewisii** Pursh, Fl. Am. Sept. 329. 1814.

Philadelphus confusus Piper, Bull. Torrey Club 29: 225, in part. 1902.

A deciduous shrub, 1–2 m. high, with ascending branches; bark of the young twigs reddish and glabrous, of the previous season's growth red or rarely yellowish-gray, with conspicuous cross-cracks and sooner or later peeling off, and of the old stems light-gray and furrowed; buds enclosed in the bases of the petioles; petioles 5–8 mm. long; leaf-blades ovate-lanceolate or ovate, thick, acute at the apex, acute or rounded at the base, glabrous or sparingly hairy on the veins or more densely so in the axils of the veins beneath, entire or denticulate, 3- or 5-ribbed, the stronger laterals arising some distance from the base of the leaf-blade; hypanthium glabrous; sepals lance-ovate, abruptly acuminate, glabrous without, finely pubescent within; petals white, elliptic to oval, rounded or retuse at the apex, 10–15 mm. long; stamens numerous; styles united half-way up or to near the top; stigmas clavate, smaller than the anthers; capsule short-obovoid with an almost conical base, about 1 cm. long.

TYPE LOCALITY: Waters of Clark's River (Clark's Fork of Columbia River in Montana).
DISTRIBUTION: Hills and copses, from central Montana to Washington and Oregon.

6. **Philadelphus angustifolius** Rydb. sp. nov.

A slender shrub with spreading branches; bark of the young twigs red or chestnut, sparingly hairy, and of the previous season's growth chestnut, with prominent cross-cracks and peeling off; buds hidden in the bases of the petioles; petioles 5 mm. long or less; leaf-blades lanceolate, acute at the base and acute or somewhat acuminate at the apex, 3–5 cm. long, usually denticulate with a few distant teeth, sparingly hairy along the veins on both sides; flowering branches 5–10 cm. long, with 1–3 pairs of leaves and a raceme of about 5 flowers; hypanthium glabrous; sepals about 5 mm. long, lanceolate, acute; petals oblong, rounded at the apex, 10–12 mm. long; styles united to near the top; stigmas clavate, narrower than the anthers.

Type collected at Palace Camp, Washington, in 1883, by Mrs. Bailey Willis.
DISTRIBUTION: Type locality and near Tacoma.

7. **Philadelphus Helleri** Rydb. sp. nov.

A shrub 2–3 m. high, with ascending branches; bark of young twigs brownish, glabrous, and of the previous season's growth yellowish or grayish or partly brown, not exfoliating; buds enclosed in the bases of the petioles; petioles about 5 mm. long; leaf-blades ovate or lance-ovate, acute at both ends or rounded at the base, denticulate or entire, 4–7 cm. long, sparingly hairy along the veins, or glabrous except the axils of the veins beneath; flowering branches 7–15 cm. long, with 2 or 3 pairs of leaves and 5–11 racemose flowers; hypanthium glabrous; sepals 7–8 mm. long, lance-ovate, short-acuminate, glabrous without, tomentose within; petals white, lance-ovate, 15–18 mm. long, obtuse or acute at the apex; stamens numerous; styles united to near the apex, or two thirds their length; stigmas clavate, narrower than the anthers.

Type collected about Lake Waha, Nez Perces County, Idaho, in 1896, by A. A. and E. Gertrude Heller, *no. 3374*.

8. **Philadelphus columbianus** Koehne, Gartenflora **1896**: 542. 1896.

Philadelphus oreganus Nutt.; T. & G. Fl. N. Am. 1: 595, as synonym. 1840.
Philadelphus confusus Piper, Bull. Torrey Club **29**: 225, in part. 1902.

A deciduous shrub, 2–3 m. high, with ascending or spreading branches; bark of the young twigs reddish or yellowish, glabrous or slightly hairy, of the previous season's growth and older stems gray, rarely with cross-cracks, but not exfoliating; buds enclosed in the bases of the petioles; petioles 5–10 mm. long; leaf-blades lanceolate to ovate, acute, or on vigorous shoots rounded at the base, more or less acuminate at the apex, denticulate with a few teeth or entire, or on vigorous young shoots dentate, more or less hairy on both sides, the hairs often with pustulate bases, 3-ribbed or more rarely 5-ribbed, the stronger pair of laterals always arising some distance from the base of the blade; flowering branches 5–15 cm. long, with 2 or 3 pairs of leaves and 3–9 racemose, inodorous flowers; hypanthium glabrous; sepals lance-ovate, more or less acuminate, 6–8 mm. long, glabrous or with scattered hairs without, tomentose within; petals elliptic or oval, rounded at the apex, white, 15–20 mm. long; styles united half their length or nearly to the apex; stigmas clavate; capsule elongated-obovoid, about 12 mm. long, somewhat 4-angled below and tapering gradually into the petioles.

TYPE LOCALITY: Cultivated, from British Columbia?
DISTRIBUTION: On river banks and hills and in copses from Idaho and British Columbia to Oregon and northern California.

9. **Philadelphus confusus** Piper, Bull. Torrey Club **29**: 225. 1902.

A deciduous shrub, 2–4 m. high, with ascending branches; bark of the young twigs light-brown or yellowish, glabrous, and of the previous season's growth gray or yellow, with cross-cracks but scarcely exfoliating; buds enclosed in the bases of the petioles; petioles 5–8 mm. long; leaf-blades ovate or lance-ovate, acute at both ends, sparingly denticulate, very thin, glabrous or slightly hairy on the veins, light-green, 2–6 cm. long; flowering branches 7–15 cm. long, with 1–3 pairs of leaves and 5–9 racemose odorous flowers; hypanthium glabrous; sepals broadly ovate, acute, glabrous without, tomentulose on the

margin within; petals white, elliptic or oval, about 15 mm. long; stamens numerous; styles united for at least two-thirds their length; stigmas broadly clavate, slightly narrower than the anthers; capsule broadly obovoid, 7–8 mm. long and almost as thick.

TYPE LOCALITY: Tum Tum Mountains, Washington.
DISTRIBUTION: Cascade Mountains of Washington.

10. **Philadelphus Gordonianus** Lindl. Bot. Reg. **24**: Misc. Notes 21. 1838.

Philadelphus cordatus Petz. & Kirchn. Arb. Musc. 203. 1864.
Philadelphus Grahami Petz. & Kirchn. *loc. cit.* 1864.
Philadelphus californicus Carr. Rev. Hortic. **37**: 339. 1866.
Deutzia californica Carr. *loc. cit.*, as a synonym. 1866.
Philadelphus globosus K. Koch, Dendr. 1. 344, as a synonym. 1869.
Philadelphus columbarius Dippel, Handb. Laubh. **3**: 342. 1893.

A deciduous shrub, 2–4 m. high, with ascending branches; bark of young twigs red or chestnut, at first slightly pubescent, of the previous season's growth yellowish or gray, not exfoliating, and of the old stems gray and rarely peeling off in age; buds enclosed in the bases of the petioles; petioles about 5 mm. long, hairy; leaf-blades ovate, more or less acuminate at the apex, acute or rounded, or in vigorous shoots subcordate at the base, usually coarsely dentate, but sometimes almost entire, more or less pubescent on both sides, densely so in the axils of the ribs beneath and all over on those of the young shoots, usually strongly 5-ribbed, all the ribs originating at the base; flowering branches 1–1.5 dm. long with 2–4 pairs of leaves and 5–9 racemose flowers; hypanthium glabrous; sepals lance-ovate, abruptly acuminate into a slender point, glabrous or with a few hairs without, slightly tomentulose within; petals white, oblong to oval, rounded or often retuse at the apex, 1.5–2 cm. long; styles united half their length or nearly to the apex; stigmas clavate; capsule ovoid, 8–10 mm. long, abruptly contracted below.

TYPE LOCALITY: Banks of the Columbia River.
DISTRIBUTION: On hills and along streams, Idaho and British Columbia to northern California.
ILLUSTRATION: Bot. Reg. 25: *pl. 32*.

11. **Philadelphus platyphyllus** Rydb. sp. nov.

A tall, deciduous shrub with ascending branches; bark of the young twigs light-brown, glabrous, of the previous season's growth and older stems gray, not exfoliating; buds enclosed in the bases of the petioles; petioles 8–10 mm. long; leaf-blades rounded, ovate or broadly oval, short-acuminate at the apex, mostly rounded at the base, coarsely dentate, thin, 4–7 cm. long, 3–5 cm. wide, sparingly hairy on both sides, densely so in the axils of the ribs beneath; ribs 5, originating near the base; flowering branches 1–2 dm. long, with 2–4 pairs of leaves and 5–11 racemose, rather crowded flowers; hypanthium glabrous or nearly so; sepals glabrous, lanceolate, acute, 6–7 mm. long; petals white, elliptic or oval, retuse or emarginate or rounded at the apex; stamens numerous; styles united half their length; stigmas clavate, narrower than the anthers; capsule elongated-obovoid, fully 1 cm. long.

Type collected on the south side of Mt. Shasta, California, in 1897, by H. E. Brown, *no. 561*.
DISTRIBUTION: Northern California and apparently also western Montana.

12. **Philadelphus intectus** Beadle, Biltmore Bot. Stud. **1**: 160. 1902.

A deciduous shrub, 2–3 m. high, with spreading branches; bark of the young twigs ochre-colored, and of the previous season's growth grayish, not exfoliating; winter-buds included in the bases of the petioles; petioles 5 mm. long or more; leaf-blades ovate, oval or elliptic, 3–12 cm. long, acute or acuminate at the apex, rounded or acute at the base, entire or remotely denticulate, glabrous or glabrate on both surfaces, prominently 3–5-ribbed, bright-green above, paler beneath; flowering branches with 2 or 3 pairs of leaves and 3–9 flowers, the lowest pair mostly axillary; pedicels and hypanthium glabrous; sepals lanceolate, acuminate, 7–8 mm. long, glabrous outside, tomentulose within; petals white, broadly oval, 15–18 mm. long, retuse; stamens 25–40; styles united; stigmas free; capsule broadly ellipsoid, about 1 cm. long.

TYPE LOCALITY: Bluffs of Cumberland River, below Nashville, Tennessee.
DISTRIBUTION: Known only from the type locality.

13. **Philadelphus latifolius** Schrad.; DC. Prodr. 3: 206. 1828.

Philadelphus undulatus K. Koch; Koehne, Gartenflora 1896: 542. 1896.

A shrub 2–3 m. high, with ascending branches; bark of the young twigs yellowish or grayish, glabrous, of the previous season's growth and older stems gray, not exfoliating; buds enclosed in the bases of the petioles; petioles 5–15 mm. long; leaf-blades thin, broadly ovate or oval or on vigorous shoots subcordate, more or less acuminate at the apex, rounded or acute at the base, 3–10 cm. long, remotely and sharply dentate to entire, glabrous or glabrate above, densely pubescent beneath, prominently 3–5-ribbed; flowering branches 6–15 cm. long, with 2 or 3 pairs of leaves and 5–9 flowers, racemosely disposed; pedicels, hypanthium and calyx externally pubescent; sepals ovate, acuminate, 5–7 mm. long; petals white, obovate, often retuse, 10–15 mm. long; stamens about 30; upper part of ovary and styles glabrous, the latter more or less united; stigmas clavate, narrower than the anthers; capsule broadly obovate, 7–8 mm. long.

TYPE LOCALITY: North America.
DISTRIBUTION: Rocky banks of streams, Tennessee and Alabama.
ILLUSTRATIONS: Loud. Arb. *f. 676*; E. & P. Nat. Pfl. 3^{2a}: *f. 36, A, B.*

14. **Philadelphus inodorus** L. Sp. Pl. 470. 1753.

Syringa inodora Moench, Meth. Pl. 678. 1794.

A deciduous shrub, with spreading branches, 2–3 m. high; bark of the young twigs yellowish or brown, glabrous; of previous season's growth dark-brown, and exfoliating, and of the old stems gray; petioles short, 3–5 mm. long; winter-buds enclosed in the bases of the petioles; leaf-blades ovate, rounded or acute at the base, acute or short-acuminate at the apex, entire or remotely denticulate, rather thick, 3–10 cm. long, glabrous or with scattered hairs above, more or less strigose beneath, 3–5-ribbed at the base; flowering branches 2–8 cm. long, with 1–3 pairs of leaves and 1–3 (rarely 4 or 5) flowers; hypanthium glabrous, tapering into the glabrous pedicel; sepals ovate, acute or short-acuminate, 8–10 mm. long, glabrous outside and tomentulose within; petals orbicular or broadly obovate, 1.5–2 cm. long; stamens many; styles usually distinct towards the apex; stigmas distinct, clavate, broader and longer than the anthers; capsule obovoid, fully 1 cm. long.

TYPE LOCALITY: Carolina.
DISTRIBUTION: Banks of streams and in moist woods, North Carolina and Tennessee to Georgia and Mississippi.
ILLUSTRATIONS: Catesby, Nat. Hist. Car. 2: *pl. 84*; Bot. Mag. *pl. 1478*; Loud. Arb. *f. 674.*

15. **Philadelphus strigosus** (Beadle) Rydb.

Philadelphus inodorus strigosus Beadle, Biltmore Bot. Stud. 1: 159. 1902.

A deciduous shrub 1–2 m. high; bark of the young twigs brown, and of the previous season's growth brown and exfoliating; buds hidden in the bases of the petioles; leaf-blades ovate or lanceolate, 2–4 cm. long, 1–2 cm. wide or on vigorous shoots larger, short-strigose or glabrate above, thickly and permanently strigose with stiff pubescence beneath, prominently 3-ribbed, entire or distantly denticulate, acute at the apex, rounded or acute at the base, deep-green above, pale-green beneath; flowering branches with 2 or 3 pairs of leaves and 1–3 flowers; pedicels and hypanthium glabrous; sepals lanceolate, acute, sometimes pale-hairy; stamens many; styles partly and stigmas wholly free; capsule obovate, 9–12 mm. long, 6–9 mm. wide.

TYPE LOCALITY: Lexington County, South Carolina.
DISTRIBUTION: Lexington and Richland Counties, South Carolina.

16. **Philadelphus grandiflorus** Willd. Enum. Hort. Berol. 511. 1809.

? *Philadelphus inodorus* Barton, Elem. Bot. 2: app. 30. 1803.
Philadelphus columbiensis Nichols. Kew. Handl. Arb. 1: 225, as a synonym. 1894.

A deciduous shrub, 2–3 m. high, with ascending or more or less spreading branches; bark of young twigs brownish, glabrous, and of the previous season's growth brown and exfoliating; winter-buds enclosed in the bases of the petioles; petioles about 5 mm. long; leaf-blades lanceolate to ovate or oval, more or less acuminate, narrowed or rounded at the

base, remotely dentate with rather small but sharp teeth, thin, 4–12 cm. long, glabrous or with short appressed pubescence; flowering branches with 1–3 pairs of leaves and 1–3 (rarely 5–9 cymose) large flowers; sepals ovate-lanceolate, long-acuminate, 12–15 mm. long, glabrous outside and finely tomentulose within; petals orbicular or broadly oval, 2 cm. long or more; stamens 40–60; styles distinct above; stigmas broadly club-shaped, broader and longer than the anthers; capsule obovoid, more than 1 cm. long, tapering into the pedicel.

TYPE LOCALITY: North America.
DISTRIBUTION: Banks of streams and rocky slopes, from Pennsylvania and Tennessee to Florida and Alabama.
ILLUSTRATIONS: Barton, Elem. Bot. **2**: *pl. 18, f. 1* (?); Sweet, Brit. Fl. Gard. **4**: *pl. 8.*

17. **Philadelphus gloriosus** Beadle, Biltmore Bot. Stud. **1**: 159. 1902.

A deciduous shrub, 2–3 m. high, with spreading branches; bark of young twigs brown, of the previous season's growth dark-brown, exfoliating, and of the old stems gray; winter-buds enclosed in the bases of the petioles; petioles 3–6 mm. long; leaf-blades ovate or elliptic, acute at the apex, rounded or acute at the base, remotely dentate, prominently 3–5-ribbed, glabrate or with short appressed hairs, thin, bright-green above, paler beneath, changing in autumn to yellow or brown; flowering branches with 2 or 3 pairs of leaves and 3–5 flowers; pedicels and hypanthium glabrous; sepals ovate-lanceolate, acute, glabrous outside; petals white, oval, about 12 mm. long; styles united half their length or less; stigmas distinct; capsule broadly ellipsoid, about 1 cm. long, 8–9 mm. thick, abruptly contracted into the pedicel.

TYPE LOCALITY: Banks of Coosa River, near Rome, Georgia.
DISTRIBUTION: Georgia and Alabama.

18. **Philadelphus speciosus** Schrad.; DC. Prodr. **3**: 206. 1828.

Philadelphus grandiflorus Wats. Dendr. *pl. 46.* 1825. Not *P. grandiflorus* Willd. 1809.
Philadelphus floridus Beadle, Biltmore Bot. Stud. 1: 160. 1902.

A deciduous shrub, 2–3 m. high, with ascending branches; bark of the young twigs brown, of the previous season's growth dark-brown, exfoliating, and of the old stems gray; winter-buds inclosed in the bases of the petioles; petioles about 5 mm. long; leaf-blades oval or ovate, 4–10 cm. long, acute or acuminate at the apex, rounded or acute at the base, remotely dentate with cuspidate-mucronate teeth, glabrous above, sparsely pubescent beneath, prominently 3–5-ribbed, paler beneath; flowering branches with 2 or 3 pairs of leaves and 1–5 flowers; pedicels and hypanthium pubescent; sepals about 8 mm. long, acuminate, pubescent outside, tomentulose within; petals white, 2–2.5 cm. long, broadly oval or obovate, rounded at the apex; styles united at the base; stigmas distinct, clavate, as thick as the anthers; stamens numerous; capsule obovoid, about 1 cm. long, tapering rather abruptly into the pedicel.

TYPE LOCALITY: North America.
DISTRIBUTION: Mountains of North Carolina and Georgia.
ILLUSTRATIONS: Bot. Reg. *pl. 2003;* Wats. Dendr. *pl. 46*, as *P. grandiflorus.*

19. **Philadelphus hirsutus** Nutt. Gen. **1**: 301. 1818.

Philadelphus hirsutus gracilis Schrad.; DC. Prodr. **3**: 206. 1828.
Philadelphus gracilis DC. *loc. cit.*, as synonym.
Philadelphus trinervius Schrad. Linnaea **12**: 399. 1838.
Philadelphus trinervius gracilis Schrad. Linnaea **12**: 399. 1838.
Philadelphus pubescens Bosc; T. & G. Fl. N. Am. **1**: 595, as a synonym. 1840. Not *P. pubescens* Loisel.
Philadelphus Godohokerii Petz. & Kirchn. Arb. Musc. 202. 1864.
Philadelphus inodorus hirsutus Wood, Bot. & Flor. 116. 1871.

A deciduous, upright or spreading shrub, 1–2.5 m. high; bark of the young twigs brownish, more or less pubescent, that of the previous season's growth brown and exfoliating, that of the old stems gray; winter-buds not enclosed in the bases of the petioles; petioles 3–5 mm. long; leaf-blades ovate to lanceolate, rounded or acute at the base, acuminate at the apex, sharply dentate or denticulate, often entire towards the base, 3–5-veined at the base, 3–8 cm. long, short-pubescent or glabrate above, grayish-hirsute beneath; flowering branches short, with 1 or 2 pairs of leaves and 1–3 (seldom 4 or 5) flowers; hy-

panthium and calyx hirsute-strigose; sepals triangular to lanceolate, 3–5 mm. long; petals creamy-white, obovate, about 1 cm. long; stamens about 25–30; styles wholly and the linear oblong stigmas partially united; capsule rounded-obovoid, about 5 mm. long, abruptly contracted below.

TYPE LOCALITY: Rocky banks of French Broad River, Tennessee, near the Warm Springs.
DISTRIBUTION: On rocky banks, North Carolina and Tennessee to Georgia and Alabama.
ILLUSTRATIONS: Sweet, Fl. Gard. **5**: *pl. 119*; Bot. Reg. **24**: *pl. 14*; Bot. Mag. *pl. 5334*; Loud. Arb. *f. 678*; Wats. Dendr. *pl. 47*.

20. **Philadelphus myrtoides** Bertol. Nov. Comm. Bonon. **4**: 421. 1840.

Philadelphus trichopetalus Koern.; Regel, Gartenflora **16**: 73. 1867.

A tall shrub; bark of the young twigs dark-brown, pubescent with short, subappressed hairs, of the older branches not exfoliating or tardily so; buds not enclosed in the bases of the petioles; petioles about 5 mm. long; leaf-blades ovate or ovate-lanceolate, rounded at the base, acuminate at the apex, remotely denticulate, strongly 3-ribbed near the base, rather firm, sparingly hirsute-strigose on both sides, paler beneath, 3–6 cm. long; flowering branches 1 dm. long or less, with 2–4 pairs of leaves and solitary or 2–3 cymosely arranged flowers; peduncles, hypanthium and calyx externally grayish-strigose; sepals ovate, acuminate, about 15 mm. long, densely tomentose within; petals broadly obovate or orbicular, about 2 cm. long, finely pubescent on both sides; stamens numerous; upper portion of ovary and styles pubescent, the latter distinct above; stigmas distinct, clavate.

TYPE LOCALITY: Volcan de Agua, Guatemala.
DISTRIBUTION: Guatemala to Costa Rica.
ILLUSTRATION: Bertol. Nov. Comm. Bonon. **4**: *pl. 43*.

21. **Philadelphus mexicanus** Schlecht. Linnaea **13**: 418. 1839.

A tall shrub, with slender, drooping branches; bark of the young twigs brownish or grayish, strigose, of the older branches somewhat darker, not exfoliating; buds not enclosed in the bases of the petioles, pubescent; petioles 1–1.5 cm. long, channelled above; leaf-blades lanceolate or ovate-lanceolate, acute at the base, acuminate at the apex, 3–7 cm. long, remotely denticulate, rather firm, strongly 3-ribbed near the base, strigose on both sides or glabrate above, paler beneath; flowering branches 5–10 cm. long, with 2–4 pairs of leaves and solitary or 2 or 3 cymosely arranged, fragrant flowers; hypanthium and calyx externally more or less canescent; sepals lance-ovate, acuminate, 8–10 mm. long; petals obovate, 12–15 mm. long, somewhat pubescent on the middle outside; stamens numerous; styles more or less united; stigmas narrow, free or rarely united at the base; capsule rounded-obovoid, fully 1 cm. long.

TYPE LOCALITY: Jalapa, Mexico.
DISTRIBUTION: Central Mexico.
ILLUSTRATIONS: Bot. Reg. **28**: *pl. 38*; Gard. Chron. II. **19**: *f. 753*, and III. **34**: *f. 89*.

22. **Philadelphus Coulteri** S. Wats. Proc. Am. Acad. **22**: 472. 1887.

A shrub 1–3 m. high, with drooping branches; bark of young twigs grayish or brownish, strigose, that of the older branches gray, not exfoliating; buds not enclosed in the bases of the petioles; petioles about 5 mm. long; leaf-blades lanceolate, acute at the apex, rounded or acute at the base, remotely denticulate, thick, hirsute-strigose above, densely white villous-strigose beneath; flowering branches short, 2–5 cm. long, with 1–3 pairs of leaves and 1–3 very fragrant flowers; pedicels, hypanthium and calyx white-silky and tomentulose; sepals lance-ovate, acute, about 8 mm. long; petals white with a reddish spot at the base, obovate, about 1 cm. long; upper portion of the ovary and the united styles hairy; capsule broadly obovate, about 1 cm. long.

TYPE LOCALITY: Zimapan, Mexico.
DISTRIBUTION: Northern and central Mexico.
ILLUSTRATION: Garden & Forest **1**: *f. 40*.

23. **Philadelphus Karwinskyanus** Koehne, Gartenflora **1896**: 486. 1896.

A tall shrub; bark of young twigs brownish, grayish-pubescent with short hairs, that of the older branches not exfoliating; buds not enclosed in the bases of the petioles; petioles

4–8 mm. long; leaf-blades 2–6 cm. long, ovate, acuminate or acute at the apex, acute or rounded at the base, remotely denticulate or entire, 3-ribbed, sparingly strigose above, densely hirsute-strigose beneath; flowering branches 1–2 dm. long, with 4–6 pairs of leaves and 5–13 flowers; pedicels, hypanthium and calyx grayish-tomentose; sepals ovate, acuminate, 7–8 mm. long; petals obovate, about 1 cm. long, sparingly pubescent along the middle; upper free part of ovary and the lower part of the style softly pubescent; stigmas large, broader than the anthers and two and a half times as long.

TYPE LOCALITY: Totolapa, Oaxaca, Mexico.
DISTRIBUTION: Mexico, States of Oaxaca and Vera Cruz.

24. **Philadelphus affinis** Schlecht. Linnaea **13**: 419. 1839.

A shrub about 4 m. high; bark of the young twigs glabrous or nearly so, and of the older branches remaining, not exfoliating; buds not enclosed in the bases of the petioles; leaves resembling those of *P. mexicanus*, but broader, ovate, acuminate at the apex, rounded or acute at the base, sharply and remotely denticulate, glabrous on both sides or slightly hairy on the veins beneath; flowering branches with 5–9 racemosely arranged flowers; pedicels 1.5–3 cm. long, with two minute bracts; hypanthium and calyx externally glabrous; sepals lanceolate, acuminate, puberulent on the margin within; petals broadly obovate, more than 1 cm. long; stamens many; upper portion of the ovary and the united styles sparingly soft-hairy; stigmas one-third as broad and about as long as the anthers; fruit drooping.

TYPE LOCALITY: Barranca de la Hacienda del Carmen, Mexico.
DISTRIBUTION: Central Mexico.

25. **Philadelphus asperifolius** Koern.; Regel, Gartenflora **16**: 73. 1867.

A branching shrub, 2–3 m. high; bark of the young twigs appressed-hairy with short stiff hairs, of the previous season's growth not exfoliating and becoming glabrate; buds short and thick, not inclosed in the bases of the petioles; leaves crowded on the short branches, oval or oval-ovate, obtuse and apiculate or acutish, about 1 cm. long and 6 mm. wide, or on the sterile shoots 3 cm. long, entire, appressed-pubescent on both sides with stiff straight hairs, somewhat more densely so on the veins beneath; flowering branches short, bearing solitary almost sessile terminal flowers, which are about 1.5 cm. wide and very fragrant; hypanthium and calyx externally densely white-strigose; sepals ovate, acute, tomentulose inside; petals white, obovate, rounded, more than twice as long as the sepals; stamens numerous; style none; stigmas united into a 4-winged column, star-shaped at the apex.

TYPE LOCALITY: Hacienda Santiaguillo, Mexico.
DISTRIBUTION: Known only from the type locality.

26. **Philadelphus argyrocalyx** Wooton, Bull. Torrey Club **25**: 452. 1898.

Philadelphus serpyllifolius var. A. Gray, Pl. Wright. **2**: 64. 1853.

A shrub, 1–2 m. high, with slender ascending branches; bark of the young twigs brown and villous, of the previous season's growth also brown and exfoliating, and of the old stems gray and furrowed; winter-buds enclosed in the bases of the petioles; petioles 1–2 mm. long; leaf-blades oval or elliptic-oval, entire, 2–3.5 cm. long, 7–12 mm. broad, acute at both ends, sparingly strigose-hirsute or glabrate above, grayish strigose-hirsute beneath; flowering branches with 2–4 rather approximate pairs of leaves and 1–3 flowers; pedicels and hypanthium white-villous; sepals ovate, acute or short-acuminate, 4–6 mm. long, densely white-woolly; petals obovate, retuse, 10–13 mm. long, white; stamens numerous; styles short, united; stigmas linear, slightly longer than the styles and more or less united; capsule obovoid, about 1 cm. long.

TYPE LOCALITY: Eagle Creek, White Mountains, New Mexico.
DISTRIBUTION: Mountains of New Mexico.

27. **Philadelphus argenteus** Rydb. sp. nov.

A low straggling shrub, with spreading branches; bark of the young twigs brown, but often covered by the dense white pubescence, of the previous season's growth chestnut and

exfoliating, and of the old stems gray; buds apparently hidden in the bases of the petioles; petioles 1 mm. long or less; leaf-blades elliptic or oval, usually acute at both ends, entire, 1–1.5 cm. long, leathery, densely strigose above, densely white silky-strigose beneath; flowering branches 1–2 cm. long, with 2 or 3 pairs of leaves and 1–3 flowers; hypanthium and the very short pedicel densely white-silky; sepals ovate, acuminate, 5–6 mm. long, white-silky without, tomentulose within; stamens about 30; upper free portion of the ovary sometimes with scattered hairs; styles wholly and the oblong stigmas partly united; capsule short-obovate, about 7 mm. long.

Type collected at Ft. Huachuca, Arizona, in 1893, by Dr. T. E. Wilcox.
DISTRIBUTION: Vicinity of Ft. Huachuca.

28. **Philadelphus ellipticus** Rydb. sp. nov.

A shrub about 1 m. high, with spreading branches; bark of the young twigs brown and more or less short-villous, of the previous season's growth brown, exfoliating, and of the old stems gray; buds hidden in the bases of the short petioles; leaf-blades elliptic, oval or rarely ovate, acute at the base, acutish at the apex, entire-margined, more or less leathery, 1–2.5 cm. long, glabrous or nearly so and shining above, pale and strigose beneath, 3-ribbed; flowering branches about 5 cm. long or less, with 2–4 pairs of leaves and usually solitary terminal flowers; the very short pedicel and hypanthium densely white-villous; sepals ovate or lance-ovate, acuminate, about 6 mm. long, densely white-villous without and along the margin within; petals white, broadly obovate, 15–18 mm. long, usually retuse at the apex; stamens many; styles wholly and the oblong stigmas partly united; capsule broadly obovoid, about 5 mm. long.

Type collected near Mesilla Park, New Mexico, in 1896, by J. D. Tinsley.
DISTRIBUTION: Southern New Mexico.

29. **Philadelphus stramineus** Rydb. sp. nov.

A straggling shrub about 2 m. high, with ascending branches; bark of the young twigs brown and more or less short-villous, of the previous season's growth chestnut and exfoliating, and of the old stems straw-colored; buds hidden in the bases of the petioles; petioles very short, 1 mm. long or less; leaf-blades oblong, lance-oblong or oval, acutish at both ends or obtuse at the apex, entire-margined, leathery, grayish-green and strigose on both sides; flowering branches 1.5–3 cm. long, with 2 or 3 pairs of leaves and 1–3 flowers; hypanthium and the short pedicels strigose; sepals ovate, acuminate, about 6 mm. long, densely strigose without, tomentulose within; petals oval, about 1 cm. long, rounded at the apex; stamens 30–40; styles united; stigmas distinct, or united below; capsule broadly obovoid, about 8 mm. long.

Type collected in the White Mountains, Mono County, California, in 1888, by W. H. Shockley.
DISTRIBUTION: Known only from the type locality.

30. **Philadelphus microphyllus** A. Gray, Mem. Am. Acad. II. **4**: 54. 1849.

A shrub 0.5–1.5 m. high, with ascending branches; bark of the young twigs brown, strigose, of the previous season's growth also brown and exfoliating, and of the old stems gray and furrowed; winter-buds hidden in the bases of the petioles; petioles 1–2 mm. long; leaf-blades oblong or oblong-lanceolate, entire, acute or acutish at both ends, somewhat 3-ribbed, leathery, 1–3 cm. long, shining and glabrous or strigose above, pale and strigose beneath; flowering branches with 2–4 pairs of leaves and 1–3 fragrant flowers; pedicels slightly strigose; hypanthium glabrous or strigose; sepals ovate, 5–6 mm. long, glabrous or strigose outside, tomentulose within; petals white, about 15 mm. long, obovate; stamens about 40; styles united; stigmas oblong, usually more or less united; capsule obovoid, about 8 mm. long.

TYPE LOCALITY: Santa Fé Creek, on sunny and steep sides of the mountains, between rocks, eleven miles above Santa Fé.
DISTRIBUTION: New Mexico and southern Colorado to Arizona.
ILLUSTRATIONS: Gard. Chron. III. **2**: 156. *f. 36*.

31. **Philadelphus occidentalis** A. Nelson, Bull. Torrey Club **25**: 374. 1898.

A shrub 0.5–1 m. high, with spreading branches; bark of the young twigs brown and hirsute-strigose, of the previous season's growth chestnut-brown and exfoliating, and of the old stems gray and furrowed; buds hidden in the bases of the petioles; petioles about 1 mm. long; leaf-blades oblong to elliptic-ovate, entire, acute at both ends, 1–2 cm. long, less shining than in the related species and only slightly paler beneath, strigose on both sides; flowering branches 1–5 cm. long, with 2–4 pairs of leaves and 1–3 flowers; hypanthium and the very short pedicels strigose; sepals ovate, acute or rarely slightly acuminate; stamens many; styles usually wholly and the oblong or slightly clavate stigmas partly united; capsule short-obovoid, 6–7 mm. long.

TYPE LOCALITY: Rock Springs, Wyoming.
DISTRIBUTION: Cañons and hillsides, Wyoming, Utah and Colorado.

32. **Philadelphus minutus** Rydb. sp. nov.

A shrub about 1 m. high, with divergent branches; bark of young twigs brown and finely strigose, of the previous season's growth dark-brown and exfoliating, of the old stems gray and glabrous; winter-buds hidden in the bases of the petioles; petioles about 2 mm. long; leaf-blades oblong, obtuse or acutish at both ends, entire, 8–18 mm. long, rather leathery, 3-ribbed, hirsute-strigose, sparingly so above, shining above, pale beneath; flowering branches with 1–4 pairs of leaves and 1 flower (rarely 3); pedicels, hypanthium and sepals strigose; sepals ovate, acute, about 5 mm. long; petals white, broadly obovate, 10–12 mm. long; stamens about 60; styles united one half to two thirds their length; stigmas clavate, smaller than the anthers.

Type collected in the Black Cañon of the Gunnison, Colorado, in 1901, by C. F. Baker, *no. 266*.

DISTRIBUTION: Cañons, Colorado.

33. **Philadelphus Palmeri** Rydb. sp. nov.

A low shrub, with slender ascending branches; bark of the young twigs light-brown, densely strigose, of the previous season's growth exfoliating, and of the old stems gray and grooved; buds not covered by the bases of the petioles; petioles 1–1.5 cm. long; leaf-blades lanceolate, acute at both ends, entire, 1–2.5 cm. long, rather thin, 3-ribbed, dull, sparingly strigose above, densely strigose beneath; flowering branches short, with 2 or 3 pairs of leaves and usually solitary flowers; hypanthium densely strigose; sepals densely strigose, ovate, acute or slightly acuminate, about 5 mm. long; petals obovate, about 12 mm. long; stamens 25–30, their filaments united two-thirds or three-fourths their length; styles very short, partly distinct; stigmas linear-oblong, distinct.

Type collected in the Sierra Madre, forty miles south of Saltillo, in 1880, by Dr. Edward Palmer, *no. 2122*.

34. **Philadelphus pumilus** Rydb. sp. nov.

A low, straggling, subspinescent shrub, with spreading rigid branches; bark of the young twigs light-brown, strigose, of the previous season's growth brown and exfoliating, and of the older branches straw-colored and at last grayish; winter-buds apparently hidden in the bases of the exceedingly short petioles; leaf-blades oblong or elliptic, obtuse, 6–10 mm. long, bright-green and hispidulous above, white-silky and tomentulose beneath; flowering branches 1–2 cm. long, with 2 or 3 pairs of leaves and mostly solitary flowers; hypanthium and the short pedicels densely strigose; sepals lanceolate, about 6 mm. long, densely strigose without, tomentulose along the margins within; petals apparently ochroleucous, elliptic, rounded or retuse at the apex, 8–10 mm. long; stamens about 30; pistil equaling the stamens; styles united, nearly 2 mm. long; stigmas more or less united, oblong, about 3 mm. long; capsule short-obovoid, about 5 mm. long.

Type collected in rocky places, in the vicinity of Tamarack Valley, San Jacinto Mountains, southern California, at an altitude of 2500 meters, in 1901, by H. M. Hall, *no. 2500*.

35. **Philadelphus serpyllifolius** A. Gray, Pl. Wright. **1**: 77. 1852.

A branched, subspinescent shrub, 1 m. high or less, with spreading rigid branches; bark of the young twigs brown and strigose, of the previous season's growth exfoliating, and of the old stems gray and furrowed; winter-buds according to Koehne not enclosed in the bases of the petioles; petioles very short, about 1 m. long or less; leaf-blades oblong or oval, obtuse, less than 1 cm. long, hirsutulous above, white-strigose and somewhat tomentulose beneath; flowering branches very short, with 1 or 2 crowded pairs of leaves and usually solitary, subsessile flowers; hypanthium and calyx silky-strigose; sepals ovate, 3–4 mm. long; petals oval, ochroleucous; styles united, very short; stigmas oblong, more or less united.

TYPE LOCALITY: Western Texas.
DISTRIBUTION: In rocky places, western Texas and New Mexico.

36. **Philadelphus Mearnsii** W. H. Evans, sp. nov.

Philadelphus Mearusii Koehne, Mitt. Deuts. Dend. Ges. **1904**: 79, merely mentioned. 1904.

A low shrub with thick stems and short divergent, spinescent branches; bark of the young twigs brownish and strigose, of the previous season's growth exfoliating, and of the old stems gray and furrowed; petioles 1 mm. long or less; leaf-blades oblong, acutish at both ends, 1 cm. long or less, entire, leathery, equally strigose on both sides; flowering branches 0.5 cm. long or less, with 2 or 3 crowded pairs of leaves and solitary flowers; hypanthium sparingly strigose; sepals lanceolate, 3.5–4 mm. long, sparingly strigose without, villous-tomentose within; petals ochroleucous, oblong-lanceolate, acute, nearly 1 cm. long; stamens about 15, shorter than the sepals; filaments free; top of ovary flat; styles united, almost none; stigmas linear, wholly united, equaling the longer stamens; capsule rounded-obovate, 2.5–3 mm. long.

Type collected near the Upper Corner monument, Grant County, New Mexico, on the Mexican Boundary Survey, 1892, by Dr. E. A. Mearns, *no. 36*.

DOUBTFUL SPECIES

Philadelphus floribundus Schrad.; DC. Prodr. **3**: 205. 1828. (Not *P. floribundus* Usteri. 1790.) Said to be of American origin, but unknown in the wild state. It resembles *P. grandiflorus* in habit, but has 5–7 racemose flowers and more or less pubescent calyx and hypanthium. It may be a hybrid of *P. grandiflorus* and *P. coronarius*.

Philadelphus insignis Carr. Rev. Hortic. **42**: 40. 1870. (*P. Billiardi* Koehne, Gartenflora **1896**: 507. 1896.) According to Koehne, described from cultivated material, probably from western America. It is not known in the native state. In general habit it resembles *P. cordifolius* Lange, but the under surface of the leaves, the hypanthium and the sepals are conspicuously hairy. The plant suggests a hybrid origin from *P. cordifolius* and *P. latifolius*.

Philadelphus laxus Schrad.; DC. Prodr. **3**: 206. 1828. (*P. humilis* DC. Prodr. *loc. cit.* as a synonym.) Described from cultivated specimens, supposed to be of North American origin, but it is unknown in the native state on this continent. Koehne states that he has received specimens from China, which he can not distinguish from the cultivated *P. laxus*. This resembles *P. grandiflorus*, but has slender branches, smaller leaves, which are strongly dentate and densely pubescent beneath, and flowers always solitary. ILLUSTRATIONS: Bot. Reg. **25**: *pl. 39*; Loud. Arb. *f. 677*.

Philadelphus pubescens Loisel. Herb. Gen. Amat. *pl. 268*. 1820. (*P. verrucosus* Schrad.; DC. Prodr. **3**: 205. 1828. *P. globosus*, *P. dubius*, *P. nivalis* and *P. niveus* K. Koch, Dendr. **1**: 343, as synonyms. 1869.) Described from cultivated material, which Loiseleur states had been received originally from the United States through Fraser. It is however unknown in the native state, although common in cultivation. It resembles *P. latifolius*, but the bark is chestnut-brown instead of gray. May be a hybrid with *P. coronarius*. ILLUSTRATIONS: Herb. Gen. Amat. *pl. 268;* Bot. Reg. **7**: *pl. 570*.

Philadelphus pendulifolius Carr. Rev. Hortic. **47**: 360. 1875. According to Koehne a hybrid of *P. latifolius* and *P. laxus*.

Philadelphus Zeyheri Schrad.; DC. Prodr. **3**: 205. 1828. Described from cultivated material supposed to be from North America. It is according to Koehne a hybrid of *P. coronarius* and *P. inodorus*.

Besides those mentioned above, there have been recorded various garden hybrids, of which one or both parents are American species.

5. DECUMARIA L. Sp. Pl. ed. 2. 1663. 1763.

Vines climbing by means of aerial rootlets, the stems woody, terete. Leaves opposite, persistent; blades thick, entire or sparingly toothed. Flowers perfect, in terminal corymbose panicles. Hypanthium turbinate, becoming campanulate and strongly ribbed. Sepals 7–10, minute. Petals white, 7–10, narrow, valvate. Stamens 20–30; filaments subulate; anthers didymous. Ovary 5–10-celled, inferior; styles united, the column tapering from the base to the apex; stigma capitate or depressed, 5–10-lobed. Ovules numerous, pendulous. Capsule urceolate, many-ribbed, opening between the ribs. Seeds narrowly clavate.

Type species, *Decumaria barbara* L.

1. Decumaria barbara L. Sp. Pl. ed. 2. 1663. 1763.

Forsythia scandens Walt. Fl. Car. 154. 1788.
Decumaria sarmentosa Bosc, Act. Soc. Hist. Nat. Par. **1**: 76. 1792.
Decumaria radicans Moench, Meth. Pl. 17. 1794.
Decumaria scandens Salisb. Prodr. 355. 1796.
Decumaria Forsythia Michx. Fl. Bor. Am. **1**: 282. 1803.

Stems mainly 1–10 cm. thick; leaf-blades ovate to oval or suborbicular, or rarely obovate, 5–10 cm. long, entire or shallowly toothed, dark-green and ultimately glabrous above, paler and sparingly pubescent beneath; petioles mainly 1–4 cm. long, pubescent; cymes erect during anthesis, pendent in fruit; hypanthium prominently bordered at the top in age; sepals deltoid, less than 1 mm. long during anthesis, and very slightly accrescent; petals oblong to linear-oblong, 3–4 mm. long, much shorter than the filaments; capsules numerous in each cyme, the body 4–5 mm. long, prominently ribbed, the broadly conic beak shorter than the body,

TYPE LOCALITY: Unknown.
DISTRIBUTION: Virginia to Florida and Louisiana.
ILLUSTRATIONS: Act. Soc. Hist. Nat. Par. 1: *pl. 13*; Lam. Tab. Encyc. **2**: *pl. 403*; Loud. Arb. *f. 679, 680*; Baillon, Hist. Pl. **3**: *f. 404*; Britt. & Brown, Ill. Fl. *f. 1860*; E. & P. Nat. Pfl. 3^{2a}: *f. 41, Q–T*.

6. EDWINIA Heller, Bull Torrey Club **24**: 477. 1897.

Jamesia T. & G. Fl. N. Am. **1**: 593. 1840. Not *Jamesia* Raf. 1832.

Shrubs, with erect stems and terete branches, the bark partially deciduous. Leaves opposite, deciduous; blades thickish, generally broadest below the middle, toothed, pubescent at least beneath. Flowers perfect, cymose, relatively large. Hypanthium turbinate, becoming hemispheric. Sepals 5, of a triangular-ovate or lanceolate type, sometimes 2-cleft. Petals 5, convolute, broadened upward above the wide claw-like bases, pubescent within. Stamens 10; filaments narrow, acuminate above; anthers didymous. Ovary conic, partially 3–5-celled; styles 3–5, distinct; stigmas obtuse, nearly terminal. Ovules numerous; capsule about half-inferior, the swollen body with a rounded base, 3–5-valved, the slender beaks long-exserted beyond the calyx. Seeds numerous.

Type species, *Jamesia americana* T. & G.

Sepals slightly longer than the hypanthium at maturity.
  Sepals acute; leaf-blades many-toothed, serrate. 1. *E. americana*.
  Sepals obtuse or retuse; leaf-blades few-toothed, dentate. 2. *E. californica*.
Sepals several times longer than the hypanthium at maturity. 3. *E. macrocalyx*.

1. Edwinia americana (T. & G.) Heller, Bull. Torrey Club **24**: 477. 1897.

Jamesia americana T. & G. Fl. N. Am. **1**: 593. 1840.

A shrub 0.5–2 m. tall, the young branches finely pubescent, the bark red or purplish, exfoliating; leaves approximate at the ends of the branches, the blades ovate to oval or suborbicular, 1.5–6 cm. long, serrate, finely and usually densely pale- or whitish-tomen-

tulose beneath, conspicuously many-veined, slender-petioled; cymes rather many-flowered; hypanthium broadly turbinate during anthesis, becoming 2–3 mm. long and swollen at maturity; sepals acute, becoming 2–3 mm. long; petals cuneate to oblong-cuneate, 10–12 mm. long; capsule-body 4–4.5 mm. long, rounded or somewhat turbinate at the base, scarcely, if at all, surpassing the sepals.

TYPE LOCALITY: Along the Platte or the Canadian River, near the Rocky Mountains?
DISTRIBUTION: Wyoming to Utah and New Mexico.
ILLUSTRATIONS: Rev. Hortic. *f. 52;* Bot. Mag. *pl. 6142;* E. & P. Nat. Pfl. 3^{2a}: *f. 36, H–M.*

2. **Edwinia californica** Small, sp. nov.

A shrub 0.5–2 m. tall, the young branches copiously pubescent, the bark mainly gray, somewhat shreddy; leaves approximate on the often contorted twigs, the blades oblong to oval, 1–3 cm. long, dentate, densely pale-strigillose beneath, few-veined, short-petioled; cymes few-flowered; hypanthium flattish during anthesis, becoming 1.5–2 mm. long and flat-turbinate at maturity; sepals obtuse or retuse, becoming 3-4 mm. long; petals often pink, cuneate, 9–11 mm. long; capsule-body 3–4 mm. long, broadly turbinate at the base, not surpassing the sepals.

Type collected at Volcano Creek Falls, Tulare County, California, July 18, 1903, by Miss Alice Eastwood.
DISTRIBUTION: California.

3. **Edwinia macrocalyx** Small, sp. nov.

A shrub less than 1.5 m. tall, the young branches finely pubescent, the bark pale-reddish, shreddy; leaves few at the tips of the nearly straight twigs, the blades oval to ovate, 1–2.5 cm. long, serrate, densely pale-strigillose beneath, several-veined, short-petioled; cymes few-flowered; hypanthium flattish during anthesis, becoming 3–3.5 mm. long and turbinate-campanulate at maturity; sepals acute, becoming 5–6 mm. long; petals white, obovate or oval-obovate, 10–12 mm. long; capsule-body 4–5 mm. long, narrowly turbinate at the base, much shorter than the sepals.

Type collected at Wahsatch, Utah, August, 1869, by Sereno Watson, *no. 371.*
DISTRIBUTION: Utah.

7. **FENDLERELLA** Heller, Bull. Torrey Club **25**: 626. 1898.

Shrubs with low or depressed stems, the bark somewhat shreddy. Leaves opposite, deciduous; blades narrow, entire, nearly sessile. Flowers perfect, small, in small compound cymes. Hypanthium turbinate-campanulate, becoming turbinate. Sepals 5, lanceolate, shorter than the hypanthium. Petals 5, white, narrowed into broad bases, the blades of an oblong or elliptic type, entire, but sometimes undulate. Stamens 10, alternately longer and shorter; filaments dilated below the slender apex; anthers didymous. Ovary conic, 3-celled, much longer than thick; styles 3, distinct; stigmas slightly introrse. Ovules several in each cavity of the ovary. Capsule narrow at the base, about half-inferior, 3-valved, septicidal. Seeds solitary in each cavity.

Type species, *Whipplea utahensis* S. Wats.

1. **Fendlerella utahensis** (S. Wats.) Heller, Bull. Torrey Club **25**: 626. 1898.

Whipplea utahensis S. Wats. Am. Nat. **7**: 300. 1873.
Fendlera utahensis Greene, Bull. Torrey Club **8**: 26. 1881.

A much-branched sometimes diffuse shrub mostly less than 1 m. tall, the leaves, branches and younger parts strigillose with pale or whitish hairs; leaves numerous, the blades oblong or elliptic to oblong-spatulate, 6-16 mm. long, inconspicuously veined, sessile; cymes several-flowered, short-peduncled; hypanthium pubescent; sepals lanceolate or oblong-lanceolate, 1–1.5 mm. long, ciliate; petals oblong or elliptic, 3–4 mm. long; filaments dilated from the base to near the apex; capsule-body about 4 mm. long, turbinate at the base.

TYPE LOCALITY: Kanab, Utah.
DISTRIBUTION: Utah, Nevada, New Mexico and Arizona.

8. **FENDLERA** Engelm. & Gray ; A. Gray, Pl. Wright. **1** : 77. 1852.

Shrubs, with terete striate branches. Leaves opposite, deciduous ; blades entire, 3-ribbed, mainly sessile or nearly so. Flowers solitary or 2 or 3 together, relatively large, pedicelled. Hypanthium turbinate, sometimes becoming broadly campanulate, 8-ribbed. Sepals 4, valvate, deltoid, triangular or lanceolate, longer than the hypanthium. Petals 4, clawed, the blades ovate-deltoid, erose. Stamens 8 ; filaments flattened, with 2 narrow appendages at the top prolonged beyond the slightly elongated anthers. Ovary broad, scarcely longer than wide during anthesis, 4-celled ; styles 4, distinct ; stigmas minute, nearly terminal. Ovules numerous, pendulous. Capsule broad at the base, crustaceous, 4-valved, less than half-inferior, septicidal. Seeds relatively large, few in each cavity of the capsule.

Type species, *Fendlera rupicola* A. Gray.

Anthers over 4 mm. long, the body gradually narrowed into the slender appendage. 1. *F. rupicola.*
Anthers less than 4 mm. long, the body abruptly narrowed into the stout appendage. 2. *F. Wrightii.*

1. **Fendlera rupicola** A. Gray, Pl. Wright. **1** : 77. 1852.

Fendlera rupicola Lindheimeri A. Gray, Pl. Wright. 1 : 77. 1852.

A branching shrub 1–2 m. tall or more, with gray striate branches, the bark ultimately somewhat shreddy, the twigs minutely pubescent ; leaves mainly approximate or clustered on short branches, the blades oblong to elliptic or oblong-lanceolate, mainly 2–4 cm. long, rarely smaller, faintly 3-ribbed, usually flat, more or less strigose, especially beneath when young, often nearly glabrous in age ; flowers solitary or 2 or 3 together, the pedicels sparingly pubescent at maturity ; hypanthium often sparingly pubescent ; sepals deltoid to triangular-lanceolate, 4–5 mm. long, or 7–9 mm. long at maturity, acute, pubescent ; petals 17–21 mm. long, the blades 11–15 mm. wide, ciliolate, coarsely erose, abruptly narrowed into the claw, or truncate at the base ; capsule-body 11–15 mm. long, the persistent sepals reaching to beyond its middle.

TYPE LOCALITY : Along the Guadalupe, above New Braunfels, Texas.
DISTRIBUTION : Colorado to western Texas, Arizona and adjacent Mexico.
ILLUSTRATIONS : A. Gray, Pl. Wright. *pl. 5* (except *f. 2, 6, 7*) ; E. & P. Nat. Pfl. **3**[2a] : *f. 36, N–Q.*

2. **Fendlera Wrightii** (A. Gray) Heller, Bull. Torrey Club **24** : 537. 1897.

Fendlera rupicola Wrightii A. Gray, Pl. Wright. 1 : 77. 185?
Edwinia Wrightii Heller, Bull. Torrey Club **24** : 477. 1897.

A shrub resembling *Fendlera rupicola*, but smaller in all its parts ; leaves commonly more crowded, the blades narrowly oblong to lanceolate or oblanceolate, and mostly apparently linear or nearly so on account of the revolute margins, mainly 0.5–1.5 cm. long, or sometimes 2 cm. long, strigillose and canescent-strigillose or lanate-strigillose beneath, at least when young ; flowers solitary or sparingly clustered, the pedicels copiously pubescent at maturity ; sepals lanceolate to triangular, 3–4.5 mm. long, or longer at maturity, but less accrescent than in *Fendlera rupicola ;* petals 12–16 mm. long, the blades 7–10 mm. wide, ciliolate, finely erose ; capsule-body 9–12 mm. long, the rather deciduous sepals seldom reaching to its middle.

TYPE LOCALITY : Along the San Pedro River, Texas.
DISTRIBUTION : Western Texas, New Mexico and northern Mexico.
ILLUSTRATION : A. Gray, Pl. Wright. 1 : *pl. 5, f. 2, 6, 7.*

9. **CARPENTERIA** Torr. Pl. Frem. 12. 1853.

Shrubs, with erect stems and opposite 4-angled branches. Leaves opposite, persistent ; blades entire, pinnately ribbed, petioled. Flowers relatively large, few together in open cymes. Hypanthium flattish, not swollen in age. Sepals 5–7, valvate, much longer than the hypanthium, persistent. Petals 5–7, broad, clawless, convolute. Stamens numerous ; filaments filiform ; anthers oval. Ovary 5–7-celled, ovoid ; styles very short, united, persistent ; stigma 5–7-lobed, terminal. Ovules numerous, radiating on the rounded axial placentae. Capsule leathery, of a conic type, 5–7-valved, septicidal, the carpels beaked. Seeds numerous, the testa markedly produced at each end.

Type species, *Carpenteria californica* Torr.

1. **Carpenteria californica** Torr. Pl. Frem. 12. 1853.

Stems mainly 1–2 m. tall, usually numerous and clustered, the bark ultimately pale and shreddy, the shoots reddish or purplish and with scattered hairs; leaf-blades thick, oblong to lanceolate, 3–8.5 cm. long, glabrous and bright-green above, glaucous and minutely pubescent beneath; pedicels sparingly pubescent; hypanthium broadly hemispheric, becoming rather flat in age and then 7–8 mm. wide; sepals lanceolate to ovate-lanceolate, 10–13 mm. long, thinly pubescent without, densely pubescent within, spreading; petals white, obovate or orbicular-obovate, 2–3 cm. long; stamens commonly about 200, the filaments variable in length; capsules 10–13 mm. long, the body rather turgid, 8–9 mm. wide.

TYPE LOCALITY: Sierra Nevada of California.
DISTRIBUTION: Southern parts of the Sierra Nevada, California.
ILLUSTRATION: Torr. Pl. Frem. *pl. 7.*

10. **WHIPPLEA** Torr. Pacif. R. R. Rep. **4**: 90. 1857.

Low or diffuse shrubs, the branches rather tender, the bark ultimately somewhat shreddy. Leaves opposite, deciduous; blades of an ovate or oval type, shallowly few-toothed, 3-ribbed. Flowers small, in compact peduncled cymes. Hypanthium rather broad, swelling in age. Sepals 5 or 6, erect or nearly so, thin, scarcely longer than the hypanthium. Petals 5 or 6, the blades of a rhombic type, spreading or recurved. Stamens 10–12 or rarely fewer, alternately longer and shorter; filaments flattened; anthers didymous. Ovary spheroidal, 4–5-celled, or 3-celled; styles 4 or 5, or 3, distinct, subulate; stigmas introrse. Ovules solitary in each cavity of the ovary, pendulous. Capsule spheroidal, separating into 3–5 leathery carpels. Seed solitary in each carpel, the testa scarcely produced at the ends.

Type species, *Whipplea modesta* Torr.

1. **Whipplea modesta** Torr. Pacif. R. R. Rep. **4**: 90. 1857.

Stems or branches spreading, reclining or trailing, 2–5 dm. long, the young parts at least finely pubescent, the several or many short flowering branches closely strigillose; leaf-blades ovate to oval, occasionally narrowly so, mainly 1–3.5 cm. long, appressed-pubescent, shallowly few-toothed, sessile or nearly so; cymes slender-peduncled, 1–2 cm. wide; pedicels 2–4 mm. long; hypanthium broadly turbinate, becoming hemispheric; sepals triangular-ovate to ovate-lanceolate, 1.5–2.5 mm. long, obtuse, strigillose; petals white, somewhat rhombic, about 3 mm. long, rounded at the apex; stamens about as long as the petals, the filaments linear to linear-lanceolate; capsules 2–2.5 mm. wide, the carpels 1.5–2 mm. long; seeds about 1.5 mm. long.

TYPE LOCALITY: Redwoods, California.
DISTRIBUTION: Coast range, middle California.
ILLUSTRATIONS: Torr. Pacif. R. R. Rep. **4**: *pl. 7;* E. & P. Nat. Pfl. 3^{2a}: *f. 36, W–Z.*

Family 7. CUNONIACEAE

By Nathaniel Lord Britton

Shrubs or trees. Leaves opposite, or rarely ternate or verticillate, stipulate, simple or compound. Inflorescence various. Flowers small, mostly perfect, sometimes polygamous or dioecious. Hypanthium with a hypogynous or perigynous disk within. Sepals 4 or 5. Petals 4 or 5, usually not larger than the sepals. Stamens as many as the petals, twice as many, or sometimes more, inserted under the margin of the disk; filaments slender, longer than the petals or equaling them; anthers short, 2-celled. Carpels usually 2, united into a 2-celled ovary, or distinct; ovules usually numerous and in 2 rows on the placenta. Fruit mostly capsular or follicular. Seeds several or numerous, often winged; embryo small; endosperm present; cotyledons flat or convex.

Ovary 2-celled, rarely 3-celled; stamens 8 or 10; flowers racemose. 1. Weinmannia.
Ovaries 2, distinct; stamens 15; flowers in terminal cymes. 2. Lyonothamnus.

1. WEINMANNIA L. Syst. ed. 10. 1005. 1759.

Windmannia P. Br. Hist. Jam. 212, hyponym. 1756.

Shrubs or trees, mostly pubescent, with opposite, imparipinnate or rarely simple leaves, the rachis often winged between the leaflets. Stipules deciduous. Inflorescence racemose, terminal or axillary, the flowers often several together. Flowers small, white, perfect or polygamo-dioecious. Hypanthium short. Sepals 4 or 5, imbricate. Stamens 8 or 10; filaments filiform; anthers small, didymous. Ovary superior, 2-celled, rarely 3-celled; styles 2, rarely 3, subulate, persistent; stigma simple. Ovules several or numerous, biseriate, pendulous. Disk thick, hypogynous, cyathiform, 8–10-angled, or 8–10-lobed. Capsule small, 2-celled, septicidally 2-valved, few-seeded to many-seeded. Seeds oblong to reniform, mostly pilose, the testa thin; embryo terete.

Type species, *Weinmannia pinnata* L.

1. Weinmannia pinnata L. Sp. Pl. 1005. 1759.

Weinmannia glabra L. f. Suppl. 228. 1781.
Weinmannia hirta Sw. Prodr. 63. 1788.
Weinmannia caripensis H.B.K. Nov. Gen. & Sp. 6: 58. 1823.
Weinmannia intermedia Schlecht. & Cham. Linnaea 5: 555. 1830.
Weinmannia nitida D. Don, Edinb. New Phil. Jour. 1830: 89. 1830.
Weinmannia alpestris Macfad. Fl. Jam. 2: 183. 1837.
Windmannia pinnata Kuntze, Rev. Gen. Pl. 228. 1891.
Windmannia glabra Kuntze, *loc. cit.* 1891.
Windmannia intermedia Kuntze, *loc. cit.* 1891.
Weinmannia glabra mexicana Pamp. Ann. di Bot. 2: 73. 1905.
Weinmannia intermedia Pittieri Pamp. *loc. cit.* 74. 1905.
Weinmannia hirta antillana Pamp. *loc. cit.* 76. 1905.

A shrub or small tree, the twigs densely pubescent to glabrate; leaves pinnate, short-petioled; leaflets 5–25, usually 9–17, oblong to ovate or somewhat obovate, sessile, obtuse at the apex, narrowed at the base, serrate, 8–20 mm. long, glabrous above, pubescent on the veins beneath or sometimes glabrous on both sides; rachis-wings broad and half-rhombic, or narrow; racemes usually longer than the leaves, 8 cm. long or less, densely many-flowered; pedicels clustered, filiform, 2–4 times as long as the calyx, appressed-pubescent; sepals ovate to ovate-lanceolate, acute, pubescent or glabrate, about 1 mm. long; petals obovate to oblong-obovate, 1-nerved, longer than the calyx; stamens about

three times as long as the calyx ; capsule ovoid, glabrous, longer than the subulate styles. Plant very variable in pubescence and in size of leaves and leaflets.

TYPE LOCALITY: Jamaica.
DISTRIBUTION: Jamaica; Cuba, Haiti, Porto Rico, St. Kitts to St. Vincent; Hidalgo and Jalapa to Costa Rica; Colombia to Brazil.
ILLUSTRATIONS: Engler in Mart. Fl. Bras. 14²: *pl. 38, f. 19–23; pl. 40, f. 4.*

2. **LYONOTHAMNUS** A. Gray, Proc. Am. Acad. **20**: 291. 1885.

A tree or shrub, the bark exfoliating in narrow strips. Leaves persistent, petioled, lanceolate, entire, crenate, aspleniform, or compound with linear-lanceolate aspleniform segments; stipules small, lanceolate or linear, deciduous. Flowers perfect, in large terminal compound cymes. Bracts minute, persistent; pedicels very short. Hypanthium campanulate, bearing 1–3 minute bractlets. Sepals 5, triangular-ovate, persistent. Disk woolly, slightly 10-lobed. Petals 5, white, nearly orbicular, not clawed, deciduous. Stamens 15, in pairs opposite the petals and singly opposite the sepals; filaments subulate; anthers oblong, introrse, the sacs longitudinally dehiscent. Pistils 2, distinct; ovary ovoid, glandular; style stout, outwardly curved; stigma subcapitate. Ovules 4 in each ovary, oblong, anatropous, suspended. Fruit of 2 small woody follicles, usually 4-seeded. Seeds oblong, pointed, with little endosperm and a membranous testa; cotyledons oblong, much longer than the straight radicle; hilum orbicular; raphe winged.

Type species, *Lyonothamnus floribundus* A. Gray.

1. **Lyonothamnus floribundus** A. Gray, Proc. Am. Acad. **20**: 292. 1885.

Lyonothamnus asplenifolius Greene, Bull. Calif. Acad. 1: 187. 1886.
Lyonothamnus floribundus asplenifolius Brand. Zoe 1: 136. 1890.

A tree, 14 m. high or less, the trunk sometimes 2.5 dm. in diameter, usually smaller, sometimes a mere shrub; bark reddish-brown, its strips remaining long attached to the trunk; young twigs pubescent, becoming orange-red and glabrous; leaves 2 dm. long or less, thick, densely white-tomentose beneath when young, becoming glabrous, or somewhat pubescent beneath when old, dark-green above, paler on the under side, varying greatly from quite simple and entire to deeply many-lobed and compound, the lobes close together, oblique, acute; cymes 1–2.5 dm. broad, densely many-flowered, pubescent; pedicels 2–3 mm. long; hypanthium tomentose, 2–3 mm. in diameter; petals 2–3 mm. broad; follicles rough-glandular, 2.5–3 mm. long.

TYPE LOCALITY: Island of Santa Catalina, California.
DISTRIBUTION: Islands of Santa Catalina, Santa Cruz and San Clemente, California.
ILLUSTRATIONS: Sargent, Silva N. Am. **4**: *pl. 197;* Sargent, Man. *f. 275;* Bull. Calif. Acad. **2**: *pl. 6;* Zoe **1**. *pl. 5.*

Family 8. **ITEACEAE**

By Nathaniel Lord Britton

Shrubs and trees. Leaves alternate, simple, toothed, estipulate. Flowers perfect, in terminal or axillary racemes or panicles. Hypanthium flattish, campanulate. Sepals 5, erect. Petals 5, valvate. Stamens 5, inserted under the margin of the disk; filaments slender; anthers oblong. Ovary superior, 2-celled, the 2 carpels united nearly or quite to the apex; style slender, grooved; stigma grooved, capitate; ovules several or numerous, in two rows on the placenta. Capsule 2-grooved longitudinally, septicidally dehiscent. Seeds usually numerous, flattish, the testa produced at each end, the endosperm copious.

1. **ITEA** L. Sp. Pl. 199. 1753.

Leaves petioled, deciduous. Flowers perfect, white, in narrow terminal racemes. Petals linear, valvate, their tips inflexed. Style slender.

Type species, *Itea virginica* L.

1. **Itea virginica** L. Sp. Pl. 199. 1753.

A shrub, 3 m. tall or less, the branches somewhat straggling, the young twigs and racemes pubescent; leaves oval, oblanceolate or rarely obovate, 4–14 cm. long, acute or short-acuminate, sharply serrulate, glabrous above, sometimes sparingly pubescent beneath, the base narrowed; petioles 1 cm. long or less; racemes 3–15 cm. long, densely flowered; pedicels 1.5–3 mm. long; hypanthium not accrescent, 2–2.5 mm. broad; petals lanceolate, acute, about 1 mm. long; petals linear or linear-lanceolate, erect or somewhat spreading, 4–5 mm. long, acutish; stamens about as long as the petals; capsule narrow, pubescent, 5–7 mm. long, 2-grooved, tipped with the persistent style.

Type locality: Virginia.
Distribution: New Jersey and eastern Pennsylvania to Florida and Louisiana.
Illustrations: Lam. Tab. Encyc. **2**: *pl. 147, f. 1;* Gaertn. Fruct. **3**: *pl. 209;* Loisel. Nouv. Duham. *pl. 9;* Bot. Mag. *pl. 2409;* Wats. Dendr. *pl. 12;* Loud. Arb. *f. 745;* Baillon, Hist. Pl. **3**: *f. 409, 410;* Engler, Nat. Pfl. 3^{2a}: *f. 45, G–M;* Britt. & Brown, Ill. Fl. *f. 1864.*

Family 9. PTEROSTEMONACEAE

By John Kunkel Small

Shrubs, with much-branched stems and dichotomous branches. Leaves alternate, with minute or obsolete stipules; blades leathery, mostly broadened upward, toothed. Flowers perfect, few together borne in corymb-like cymes. Calyx of 5 erect persistent valvate sepals of a triangular type surmounting the hypanthium. Corolla of 5 persistent imbricated ultimately reflexed white petals. Androecium of 5 stamens with broad filaments several-toothed near the apex and 5 narrower staminodia. Gynoecium of 5 united carpels. Ovary inferior, 5-celled; styles united; stigma radiate, the lobes together with the tips of the style often separating in age. Ovules 4–6 in each ovary-cavity, borne on the axial placentae. Fruit capsular, woody, surmounted by the erect sepals and reflexed petals, septicidal. Seed solitary.

1. **PTEROSTEMON** Schauer, Linnaea **20**: 736. 1847.

Characters of the family.

Type species, *Pterostemon mexicanus* Schauer.

1. **Pterostemon mexicanus** Schauer, Linnaea **20**: 736. 1847.

A shrub usually 2–4 m. tall, the twigs closely fine-pubescent; leaves crowded or approximate at the ends of the branchlets, the blades oval, suborbicular or obovate, 1–2.5 cm. long, finely and often irregularly toothed, somewhat glandular and with impressed veins above, prominently reticulated and pubescent beneath, rounded or somewhat cuneate at the base, short-petioled; hypanthium with a flattish base during anthesis; sepals erect, triangular, sometimes deltoid, 2–2.5 mm. long, minutely pubescent and sparingly glandular; petals 6–7.5 mm. long, firmly recurved, the blades broadly oblong or ovate-oblong, with somewhat involute margins, the claws short and thicker than the blades; filaments and staminodia minutely pubescent, the former about 5 mm. long, the latter about 4 mm. long; capsule 5-valved.

Type locality: Zimapan, Mexico.
Distribution: Mexico.
Illustration: E. & P. Nat. Pfl. 3^{2a}: *f. 42.*

Family 10. HAMAMELIDACEAE

By Nathaniel Lord Britton

Alternate-leaved shrubs or trees, the leaves simple, petioled, stipulate, or rarely estipulate. Flowers perfect, polygamous or monoecious, variously clustered, sometimes spicate. Hypanthium usually campanulate. Calyx of 4 or 5 usually imbricated sepals. Corolla of 4 or 5 linear or spatulate petals, or wanting. Stamens 4 to many; filaments distinct; anthers 2-celled, introrse. Ovary 2-celled, partly inferior; styles 2, distinct, often persistent; ovule solitary in each carpel, anatropous, pendulous. Fruit a woody or coriaceous capsule, often elastically dehiscent. Seed oblong; testa bony, shining; embryo straight; cotyledons oblong, flat; radicle terete; endosperm thin, cartilaginous.

Petals none; stamens numerous. 1. Fothergilla.
Petals 4, ribbon-shaped; stamens 4; staminodes 4. 2. Hamamelis.

1. FOTHERGILLA Murr. Syst. Veg. ed. 13. 418. 1774.

Monoecious, pubescent shrubs, with alternate, petioled, deciduous, somewhat inequilateral leaves. Flowers in terminal, bracted spikes, white, fragrant, appearing with the leaves or before them. Hypanthium campanulate. Calyx truncate or obscurely 5–7-lobed. Petals none. Stamens numerous, in one series, conspicuous; filaments clavate-filiform. Ovary usually 2-celled, sometimes 3-celled, partly inferior; styles 2, rarely 3, subulate-filiform; ovule solitary in each cavity. Capsule oblong or ovoid, somewhat compressed, 2-beaked, rarely 3-beaked, by the persistent styles.

Type species, *Fothergilla Gardeni* Murr.

Flowers unfolding before the leaves; leaves 3–6 cm. long; capsules oblong, 6–10 mm. long.
  Leaves broadly ovate, cordate at base, coarsely toothed mostly from below the middle to the apex. 1. *F. parvifolia.*
  Leaves, at least the upper ones, oblong or oblong-ovate, narrowed or truncate at the base, toothed above the middle. 2. *F. Gardeni.*
Flowers appearing with the leaves; leaves 7–12 cm. long; capsules ovoid, 10–13 mm. long. 3. *F. major.*

1. **Fothergilla parvifolia** Kearney; Small, Fl. SE. U. S. 509. 1903.

A shrub, 5 dm. high or less, with long rootstocks, sending up slender, often simple stems in large patches, the twigs, leaves and inflorescence finely pubescent; leaves firm in texture, broadly ovate, oval or suborbicular, coarsely crenate or crenate-dentate, mostly from below the middle to the apex, 6 cm. long or less; petioles slender, 5–10 mm. long; flowers appearing before the leaves; spikes dense, 2–3 cm. long; capsule 6–8 mm. long, oblong, the subulate beaks about 3 mm. long.

Type locality: Jesup, Georgia.
Distribution: Sandy soil, North Carolina to Florida.

2. **Fothergilla Gardeni** Murr. Syst. Veg. ed. 13. 418. 1774.

Hamamelis virginiana carolina L. Mant. 333. 1771.
Fothergilla alnifolia L. f. Suppl. 267. 1781.
? *Hamamelis monoica* Walt. Fl. Car. 255. 1788.
Fothergilla carolina Britton, Mem. Torrey Club **5**: 180. 1894.

A shrub 6 dm. high or less, the stems and branches slender; leaves firm in texture, oblong, oblong-ovate, or the lower ones ovate-orbicular, finely and densely pubescent beneath, sparingly stellate-pubescent above when young, 5 cm. long or less, dentate or repand-dentate toward the usually obtuse apex, narrowed or truncate at the base, or the

lower cordate; petioles pubescent, 6 mm. long or less; flowers appearing before the leaves; spikes 1–4 cm. long; filaments 10 mm. long or less; hypanthium pubescent, 5 mm. long in fruit; capsule 8–10 mm. long, oblong, its subulate beaks 2–3 mm. long.

TYPE LOCALITY: Carolina.
DISTRIBUTION: Virginia to Georgia.
ILLUSTRATIONS: Lam. Tab. Encyc. *pl. 480;* Nouv. Duham. **4**: *pl. 26;* Bot. Mag. *pl. 1341, 1342;* Dict. Sci. Nat. *pl. 199;* Guimp. Otto & Hayne, Abb. Holz. *pl. 16;* Bot. Cab. *pl. 1576;* Loud. Arb. *f. 758, 759;* Baillon, Hist. Pl. **3**: *f. 468–470;* Britt. & Brown, Ill. Fl. *f. 1878.*

3. **Fothergilla major** Lodd. Bot. Cab. *pl. 1520.* 1829.

Fothergilla monticola Ashe, Bot. Gaz. **24**: 374. 1897.

A shrub, often 1 m. high or more, larger and stouter-branched than *F. Gardeni;* leaves thin in texture, suborbicular, obovate or ovate, pubescent beneath, at least on the veins, glabrous or nearly so above, 7–12 cm. long, usually bluntly acute at the apex, cordate, subcordate, or some of them narrowed at the base, coarsely repand-dentate, or sometimes nearly entire; petioles stout, pubescent, 5–10 mm. long; flowers appearing with the leaves; spikes 4–7 cm. long, dense above, looser toward the base; filaments 11–15 mm. long; fruiting hypanthium 8 mm. long, densely pubescent; capsule ovoid, 10–13 mm. long, its stoutly subulate beaks 3–4 mm. long.

TYPE LOCALITY: North America.
DISTRIBUTION: Mountains of North Carolina to Alabama.
ILLUSTRATION: Lodd. *loc. cit.*

2. **HAMAMELIS** L. Sp. Pl. 124. 1753.

Trilopus Adans. Fam. **2**: 381. 1763.

Shrubs or small trees, with scaly bark, alternate, petioled, inequilateral leaves, the small acute stipules deciduous. Flowers perfect or polygamous, borne 3 together on short lateral bracted peduncles, and subtended by bractlets. Hypanthium campanulate, persistent. Sepals 4, reflexed. Petals 4, linear, ribbon-shaped, or wanting in the fertile flowers. Stamens 4, opposite the sepals, alternating with as many strap-shaped staminodes; filaments subulate, shorter than the calyx, the connective stout; anther-sacs separated by the connective, dehiscent by valves on the outer edge. Ovary of 2 one-celled carpels united at the base; styles 2, subulate; stigma terminal, minute. Ovules 1 or 2 in each carpel. Capsule woody, 2-beaked, elastically loculicidally dehiscent. Seeds elongated, the testa shining.

Type species, *Hamamelis virginiana* L.

1. **Hamamelis virginiana** L. Sp. Pl. 124. 1753.

Hamamelis dioica Walt. Fl. Car. 255. 1788.
Hamamelis androgyna Walt. *loc. cit.* 1788.
Hamamelis corylifolia Moench, Meth. 273. 1794.
Hamamelis macrophylla Pursh, Fl. Am. Sept. 116. 1814.
Hamamelis virginiana parvifolia Nutt. Gen. 1: 107. 1818.
Hamamelis caroliniana Walt.; Steud. Nom. 388, as a synonym. 1821.
Hamamelis nigra, H. estivalis, H. rotundifolia, H. dentata, H. parvifolia Raf. New Fl. **3**: 16, 17. 1836.
Trilopus virginica, T. nigra, T. estivalis, T. rotundifolia, T. dentata, T. parvifolia Raf. *loc. cit.* 15–17. 1836.

A shrub, or small tree, attaining a maximum height of about 10 m., and a trunk diameter of about 4 dm., the branches spreading; bark thin, brown without, reddish within; young twigs stellate-scurfy, becoming glabrous and reddish-brown; buds acute, puberulent; leaves firm in texture, obovate, oval or suborbicular, 4–16 cm. long, acute or obtuse, strongly pinnately veined, coarsely crenate, at least above the middle, stellate-pubescent when young, more or less pubescent when old, or the dark-green upper surface glabrous; stipules lanceolate, acute, about 1 cm. long, deciduous; flowers unfolding in autumn, the short-stalked clusters borne in the axils of leaves of the season; hypanthium pubescent; sepals triangular, spreading or reflexed; petals linear, bright-yellow, 2 cm.

long or less; stamens short; ovary villous; capsule ovoid, 12–15 mm. long, tomentulose, elastically dehiscent in the autumn; seeds 7–9 mm. long, nearly black.

TYPE LOCALITY: Virginia.

DISTRIBUTION: Nova Scotia to Ontario, Wisconsin, Nebraska, Florida and Texas.

ILLUSTRATIONS: Catesby, Nat. Hist. Car. App. *pl. 2*; Duham. Arb. & Arbust. **1**: *pl. 114*; Wangenh. Nordam. Holz. *pl. 29, f. 62*; Lam. Tab. Encyc. *pl. 88*; Schkuhr, Handb. *pl. 27*; Nouv. Duham. **7**: *pl. 60*; Bot. Cab. *pl. 598*; Barton, N. Am. Fl. *pl. 78*; Guimp. Otto & Hayne, Abb. Holz. *pl. 75*; Raf. Med. Fl. **1**: *pl. 45*; Schnizl. Icon. *pl. 167, f. 18–25, 27–29*; Baillon, Hist. Pl. **3**: *f. 462–464*; Traité Bot. Med. *f. 2398–2400*; Emerson, Trees Mass. **2**: 472, *pl.*; Loud. Arb. *f. 756, 757*; Le Maout & Dec. Traité Gen. 271, *f.*; Lauche, Deutsche Dendr. ed. 2. *f. 220*; E. & P. Nat. Pfl. **3**^{2a}: *f. 73*; Sargent, Silva N. Am. *pl. 198*; Sargent, Man. *f. 270*; Griffith, Med. Bot. *f. 165*; Johnson, Med. Bot. N. Am. *f. 127*; Millsp. Am. Med. Pl. *pl. 58*; Britt. & Brown, Ill. Fl. *f. 1879*; Lounsberry, Guide Trees, *pl. 88*; Keeler, Native Trees, 158, *pl.*

Family 11. **ALTINGIACEAE**

By Percy Wilson

Forest trees producing a balsamic resin, with furrowed bark, and terete or sometimes corky-winged branchlets. Leaves alternate, evergreen or deciduous; blades glandular-serrate, palmately lobed or unlobed; petiole much shorter than the blade, or as long; stipules mostly deciduous. Flowers usually monoecious, sometimes perfect, in heads surrounded by three or four deciduous bracts. Perianth wanting. Heads of staminate flowers in terminal racemes or panicles; androecium of numerous stamens, interspersed with minute scales. Pistillate flowers in solitary, long-peduncled axillary heads; gynoecium of two united carpels; ovary partly inferior; stigmas stout, persistent or deciduous; ovules several or numerous in each carpel, horizontal. Fruit a hard, dry, multicapsular head, sometimes armed with the stout persistent stigmas. Capsules opening at the apex, between the bases of the stigmas. Fertile seeds few, samara-like or ovate, winged; testa crustaceous, commonly marked with resinous ducts; embryo straight, imbedded in the fleshy endosperm, the cotyledons flat. Sterile seeds numerous, wingless, angled.

1. **LIQUIDAMBAR** (Clayton) L. Sp. Pl. 999. 1753.

Deciduous trees with long-petioled, palmately-lobed leaf-blades and small usually monoecious flowers, the staminate heads in terminal panicles or racemes, the pistillate capitate and united by the accrescent receptacles. Ovaries two-beaked; ovules many; stigmas two. Capsules two-beaked, two-valved at the summit. Fruit a globose woody strobile, the carpels armed with persistent stigmas. Fertile seeds winged at one end.

Type species, *Liquidambar styraciflua* L.

1. **Liquidambar styraciflua** L. Sp. Pl. 999. 1753.

Liquidambar gummifera Salisb. Prodr. 393. 1796.
Liquidambar barbata Stokes, Bot. Mat. Med. 4: 332. 1812.
Liquidambar macrophylla Oerst. Am. Cent. 16. 1863.
Liquidambar styraciflua mexicana Oerst. *loc. cit.* 1863.

A tree attaining a maximum height of 50 m. and a trunk-diameter of 1.5 m.; bark somewhat corky, deeply fissured and usually ridged, the young branches often winged with thick corky ridges; leaf-blades variable in size, suborbicular in outline, deeply palmately 3–7-lobed, cordate to nearly truncate at the base, dark-green and glabrous above, paler beneath, when young pilose, but with age becoming glabrous with the exception of the ferruginous tomentum, which is persistent in the axils of the primary veins, the lobes triangular to lanceolate, acute to acuminate at the apex; petioles about as long as the blades; stipules entire, lanceolate, 1–1.4 cm. long, caducous; racemes or panicles of staminate heads 5–7 cm. long, clothed with a rufous tomentum; pistillate flowers in globular long-peduncled heads; fruit pendulous, 3–4 cm. in diameter, persistent during the winter, armed with hardened introrse stigmas; capsules dehiscing during the fall; fertile seeds about 1 cm. long, marked with resinous ducts; sterile seeds brownish, 2 mm. long and as broad, often sharply pointed at the ends, numerous.

Type locality: Virginia.

Distribution: Connecticut to Missouri, Florida and Texas, and southward in the mountains of central and southern Mexico and in Guatemala.

Illustrations: Catesby, Nat. Hist. Car. **2**: *pl. 65*; Gaertn. Fruct. *pl. 90*, *f. 6*; Abbot, Insects of Georgia, *pl. 48*; Oerst. Am. Cent. *pl. 10* (as *L. macrophylla*), *pl. 11* (as *L. styraciflua mexicana*); Schkuhr, Handb. **3**: *pl. 307*; Nouv. Duham. **2**: *pl. 10*; Michx. f. Hist. Arb. Am. **3**[4]: *pl. 4*; Lam. Tab. Encyc. *pl. 783*; Schnizl. Icon. *pl. 98*, *f. 1*, *5*, *16–21*; Sargent, Silva N. Am. *pl. 199*; Sargent, Man. *f. 269*; Britt. & Brown, Ill. Fl. *f. 1880*.

Family 12. **PHYLLONOMACEAE**

By Henry Hurd Rusby

Trees or shrubs, with alternate, estipulate, simple leaves, bearing the cymose inflorescences upon the upper surface of their midribs. Hypanthium turbinate. Disk epigynous, broad, fleshy, covering the bases of the petals and filaments. Sepals 5, open, 3-toothed, persistent. Petals 5, borne on the margin of the hypanthium, valvate, spreading, acute, tardily deciduous. Stamens 5, alternate with the petals and inserted with them; filaments subulate, recurved; anthers 2-celled. Ovary dicarpellary, 1-celled, the two prominent parietal placentae each bearing ovules in two series; styles coalescent with the disk, the 2 small, subulate, recurved stigmas sessile on the disk. Fruit small, baccate, 1-celled, few-seeded. Seeds oblong, doubly obtuse, the testa coriaceous, rough; embryo small, straight, embedded in the copious fleshy endosperm.

The family consists of the following genus only:

1. **PHYLLONOMA** Willd.; R. & S. Syst. Veg. **6**: xx, 210. 1820.

Characters of the family.

Type species, *Phyllonoma ruscifolia* Willd.

1. **Phyllonoma laticuspis** (Turcz.) Engler, in E. & P. Nat. Pfl. 3^{2a}: 87. 1890.

Dulongia laticuspis Turcz. Bull. Soc. Nat. Mosc. 31^{1}: 454. 1858.

Phyllonoma ruscifolia Hemsl. Biol. Centr. Am. Bot. **1**: 385. 1880. Not *P. ruscifolia* Willd. 1820.

Glabrous; branches ascending, slender, terete, the internodes 7–15 mm. long; petioles 3–5 mm. long, slender; blades 4–8 cm. long, 1–2 cm. wide, lanceolate, short-acuminate at the base, long-acuminate and attenuate at the apex, sharply serrate with erect teeth, membranaceous, dark-green above, drying yellowish-brown underneath, the midrib and venation slender, slightly prominent underneath, the secondaries about 20 on each side below the origin of the inflorescence; inflorescence borne at about two-thirds or three-fourths of the length of the blade, a single flower first appearing, followed by a branch on either side which develops into a very short pseudo-raceme, its rachis at length becoming peduncle-like, and nodose from the fallen flowers; pedicels slender, 1–2 mm. long; flower 2 mm. broad, white; disk blackish when dry, 1 mm. broad; petals 1 mm. long, two-thirds as broad, ovate; stamens two-thirds as long as the petals; berry 3–4 mm. broad, depressed-globose, the calyx-segments broadly triangular.

Type locality: Oaxaca, Mexico, at 1500–1800 meters.
Distribution: Sierra Madre to Orizaba, Mexico.
Illustration: Engler, *loc. cit. f. 49.*

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